



**DEFINING BASE OPERATING SUPPORT  
AND AIRFIELD OPERATING SUPPORT**

GRADUATE RESEARCH PAPER

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AND AIRFIELD OPERATING SUPPORT

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## **Preface**

As you read this research paper you may notice that sections pertaining to the different services are disproportionate. The Air Force is covered in relatively cursory fashion compared to the Army. The reason for this disparity is two-fold. First, the initial intended audience of this research paper is comprised largely of Air Force officers who are generally familiar with Air Force organization and activities. Their familiarity with Army organization and capabilities is unknown. Given this, I erred on the conservative side and provided substantially more information on the Army than on the Air Force. The second reason is that as an Air Force officer myself, I was comfortable with basic review of Air Force documents. I found that a preponderance of my research time and challenges focused on understanding the Army organization and capabilities found within that organization. This research paper reflects the level of effort I put into augmenting my understanding of these two services, their structures, and their capabilities. Although I struggled with the Army field manuals, I thoroughly enjoyed the opportunity to educate myself on a sister service and look forward to putting this new knowledge to work in the field.

Next, I would like to thank all of those individuals who made this accomplishment possible. First of all, I would like to thank Major General Fox, then the AMC/CE and now The Air Force Civil Engineer, for challenging me with this project. It was a journey worth taking and I hope it proves worthwhile for others. Next I would like to thank my advisor, Lieutenant Colonel Heidi Brothers, AFIT/ENV, for her dedication to me and this project and for her academic

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I would like to dedicate this paper to the two most important people in my life. First, I must thank my daughter for her unquestioning love even when daddy had to go to work. Certainly, my greatest thanks must go to my wife. Without her encouragement, love, and support, I would not have applied to the ASAM program, let alone enjoyed the successes I have throughout the year. She makes me better by allowing me to be me; she makes every day better by standing beside me, hand in hand.

David S. Vaughn

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## **Abstract**

Differing levels of airfield operating support at various forward operating locations during Operation ENDURING FREEDOM impacted mission accomplishment and operational effectiveness, generated dissatisfaction among service leadership. A lack of a common vocabulary from which to base expectations, roles, and responsibilities for support left commanders unaided to work things out in the field. This graduate research paper explores joint doctrine, as well as joint and service task lists, to determine if there are existing definitions of base and/or airfield operating support. Finding only partial definitions, the paper next reviews lessons learned to validate the issue in the context of the partial definitions.

With a basic understanding of what base and airfield operating support are, this paper reviews the organizational structures of the Air Force and Army in home station and expeditionary environments. Through analysis of the activities of these organizations, four models were developed. These four models, two each for base and airfield operating support, are melded into a single model. This final model, viewed in the definitional and organizational context developed previously, is the definition of base and airfield support. The model shows that base and airfield operating support are separable, but highly interrelated. A cursory view of several alternative methods of accomplishing base and/or airfield support is included.

# DEFINING BASE OPERATING SUPPORT AND AIRFIELD OPERATING SUPPORT

## **I. Introduction**

The purpose of this research paper is to define base and airfield operating support. An analysis of service capabilities to perform these support activities will reveal their relationship to each other. Additionally, this analysis is designed to determine whether airfield operating support (AOS) can be separated from base operating support (BOS).

While an essential part of this research is to define BOS and AOS, a brief description of their generic characteristics seems appropriate at the outset. BOS is a broad range of activities, services, and resources focused on the support of a force structure, both in peacetime and war, at either a home station or expeditionary installation. BOS provides the logistics to make a combat force effective and to sustain the force. Examples of BOS are transportation, general engineering, messing, supply, chaplain services and public affairs. AOS is related to BOS; and in respect to certain activities, the two may overlap. AOS activities include the manpower and logistic resources required to enable and sustain air operations at a specified location which includes an improved aircraft landing and takeoff surface. In the case of fighter aircraft, this support will

include munitions handling and storage; while at an aerial port, cargo and passenger specialists will be required in sufficient numbers to on and off load aircraft. The nature of air operations will necessitate the provision of flight specific support such as navigation aids, airfield lighting, and aircraft maintenance capabilities.

## **Background**

The issue of BOS, and more specifically AOS, came to a head following the terrorist attacks of 11 September 2001. The U.S. military quickly ramped up to engage Al-Qaida, the terrorist organization responsible for the attacks, as well as the Taliban regime in control of Afghanistan. Military operations in Afghanistan, known as OPERATION Enduring Freedom (OEF), presented the U.S. military with the challenge of establishing logistical channels to move and sustain substantial operations in an area with limited supporting infrastructure. This situation required the establishment of multiple airfields in and around Afghanistan from which strategic and tactical aircraft could operate.

It is important to note that at this time, the concept of AOS, let alone its division from BOS, really does not exist in the military vocabulary, and certainly not in doctrine. Assignment of BOS responsibility inherently included AOS responsibility. Exceptions exist in which doctrine directs a particular service to provide specific support. An example of this is the Air Force's tanker airlift control element (TALCE), which is routinely called upon to provide command and control for airlift and tanker operations at austere locations.

U.S. Central Command (USCENTCOM), as the combatant command responsible for executing the Afghani war, designated several significant bases and the respective service responsible for BOS. The Air Force was designated the BOS provider for Jacobabad, Pakistan and Manas, Kyrgyzstan. The Army was designated the BOS provider for Karshi Khanabad, Uzbekistan and Bagram and Khandahar, Afghanistan (Higdon, 2002). Ostensibly, the Air Force received Jacobabad and Manas because these locations would serve as forward tanker and fighter projection platforms. The Army received the others because they would serve as land force projection platforms. The landlocked nature of Afghanistan, the deplorable transportation infrastructure, and the need for rapid deployment and force build-up, required the ground force be air transported directly to their projection platforms. Thus, the establishment, repair, and development of airfields became imperative where strategic airlift could deliver the personnel and materiel required to engage and defeat an entrenched, but also elusive, enemy.

Reception and beddown of forces and support of strategic airlift operations were critical facets to the success of U.S. Central Command's strategy. The capability of the designated BOS provider to support the strategic airlift mission came into question as early as the winter of 2001, and was a topic of discussion within the Air Mobility Command by March 2002. "...[T]he issue of substandard airfield BOS at forward locations 'chopped' to other components" became an item of discussion during a Headquarters Air Mobility Command (HQ AMC) OEF Lessons Learned brief on 6 March 2002 (Fox, 2002a). HQ AMC "took the

position that airfield BOS should fall to the Air Force as a matter of doctrine, especially at airfields we [AMC] use on a frequent basis” (Fox, 2002b). Of significant concern were differing standards, as well as, differing training standards and proficiency levels (Fox, 2002b).

HQ AMC engaged Headquarters United States Air Force (HQ USAF) in an attempt to gain support and prepare for conversation with the other services. United States Transportation Command (USTRANSCOM), on behalf of HQ AMC, also engaged United States Central Command (USCENTCOM) on the issue. Focused on the shooting war they were executing at the time, USCENTCOM was limited to acknowledging an airfield BOS issue existed, but a solution would not be worked until the most critical combat operations concluded (Robison, 2002).

### **Problem Statement**

Differing levels of AOS at various forward operating locations impact mission accomplishment and operational effectiveness, generating dissatisfaction among service commanders.

### **Primary Research Objective**

- Define BOS and AOS.

### **Secondary Research Objectives**

- Determine if BOS and AOS can be accomplished independently.
- Identify alternative methods of accomplishing AOS requirements.
- Identify when, where and why AOS failed.

- Recommend doctrinal changes in regards to BOS and AOS definitions and assignment of responsibility.

## **Methodology**

The conclusions found in this research effort result from a qualitative approach. The initial step involved a literature review of joint doctrine, joint and service task lists, and lessons learned, as each area pertained to BOS and/or AOS. This review established an understanding of the capabilities the military and the services should be able to provide, as well as examples where they fell short of expected levels of performance. This basic understanding of service capabilities with respect to BOS and/or AOS serves as a platform for the remainder of this research effort.

With an understanding of the required capabilities associated with providing BOS and/or AOS, the next step involved researching service organizational structures. The internal organizational structure of a service may facilitate the provision of BOS and/or AOS activities better than another service. This research effort involved the study of Air Force and Army organizational structures in both home station and expeditionary configurations. The Navy and Marine Corps were omitted from this research because of their focus on maritime operations, generally limiting significant operations to off-shore and near-shore areas.

The Air Force and Army organizational structures were analyzed against the backdrop of capabilities discussed in the literature review of joint doctrine and task lists. Four basic models emerged: Air Force BOS, Army BOS, Air Force

AOS, and Army AOS. The two BOS models were merged to develop a single definition of BOS; the same was done for AOS. The final analysis involved the examination of the relationship between BOS and AOS.

### **Significance of Research**

There are several potential benefits as a result of this research effort. First, defining BOS, and subsequently AOS, will assist the service designated as the provider of such support categories to better understand their responsibilities. Additionally, if AOS and BOS are separable and assigned to different services, the two forces can work to compliment each other rather than clash over support issues. Second, the conclusions of this research may be used as a basis to initiate change to existing service and/or joint doctrine and combatant command guidance to codify a system whereby AOS and BOS responsibility are assigned to the service most appropriately prepared to meet mission requirements. Third, this paper may identify reasonable alternatives to augment the service forces to again ensure mission requirements are met.

### **Preview of Remaining Chapters**

Chapter II, Literature Review, includes discussions of current joint doctrine and an in depth look at the joint and service task list systems to assess the capabilities required of the military. The literature review also provides coverage of lessons learned as documented through joint and service data bases and



collection agencies aimed at studying field observations to provide insight and suggested improvements for future operations.

Chapter III, Organizational Structures, provides the Air Force and Army installation organizational frameworks for both home station and expeditionary operations. These frameworks are the basis from which definitions for base and airfield operating support are derived.

Chapter IV, Support Models, utilizes the frameworks presented in Chapter III to develop four models: Air Force BOS, Army BOS, Air Force AOS, and Army AOS. Additionally, several alternative methods of accomplishing AOS and BOS are discussed, including other military, host nation support, and contract options. A second phase of analysis pulls together the two BOS models and two AOS models to produce single definitions of each BOS and AOS. In addition to defining each term, this chapter discusses the relationship of each to the other.

Chapter V, Conclusion and Recommendations, provides closing thoughts on the subject on BOS and AOS. Additionally, limitations of this research effort, as well as areas for further study, will be addressed.

## **II. Literature Review**

### **Overview**

This chapter provides a foundation for the remainder of this research effort through a thorough review of available literature that addresses base operating support (BOS) and airfield operating support (AOS), or their principle characteristics. The definitions, capabilities, and observations discussed provide the necessary framework required to fully comprehend and engage the subject of base and airfield support. The chapter is organized into three sections: doctrine, task lists, and lessons learned. Doctrine guides the effective employment of US military forces “by promoting a common perspective from which to plan, train, and conduct military operations in combat and noncombat situations” (JP 1, 2001:I-8).

The first goal of this research was to determine if a definition of BOS and/or AOS was published, providing the necessary basis for successful joint operations. A review of doctrinal documents also provided insight into the assignment of, as well as responsibility for, support functions. Another goal was to investigate the published capabilities, and therefore expectations, of the joint staff and the services. In some respects an extension of doctrine, task lists answer the question of “what” the military is to be capable of performing; doctrine generally answers only the “who” and “how” questions (CJCSM 3500.04C, 2002:A-3). The final goal of this chapter is to review observations from the field.

These observations, generally referred to as lessons learned, are regularly collected by the military in hopes of improving training and operations to make the fighting force more effective in the future.

## **Doctrine**

For purposes of this research, doctrine refers generally to the body of documents in which 'doctrine' can be found in the title, and the reference documents that support these. Specifically, this review is limited to joint doctrine, the body of documents written by the Joint Chiefs of Staff (JCS). Joint doctrine discusses issues and capabilities in very broad terms, allowing the services to be more specific in their respective doctrine. Each service, however, interprets doctrine differently. For instance, the Air Force generally includes only fundamental concepts in doctrine, while the Army's operational and tactical field manuals are considered doctrine documents by that service. Some of these operational and tactical documents will be introduced in later chapters to support methodology or analytical discussions, but were not included in this initial review.

To ensure unity of effort and common understanding among the services, joint doctrine should provide a definition of BOS and AOS. A thorough review of joint doctrine discovered that no universal definition of BOS or AOS exists. Joint doctrine, however, does contain numerous definitions of terms that will aid in developing a definition of BOS and AOS. There are definitions of base and basing, support, sustainment, and logistics, as well as airfield, airhead, and aerial port, that can be melded to generate more comprehensive ideas of what

the joint community envisions for these two related, yet operationally unique, activities.

Excluding airfield, airhead, and aerial port for a moment, the remaining group of terms pertains generally to BOS. According to Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms, as amended through 9 January 2003, a *base* is defined as “1. A locality from which operations are projected or supported. 2. An area or locality containing installations which provide logistic or other support” (60). Complementing this definition is an excerpt from the Joint Doctrine Encyclopedia definition of *basing*, which reads,

[...] Bases [...] are typically selected to be within operational reach of the opponent, where sufficient infrastructure is in place or can be fabricated to support the operational and sustaining requirements of deployed forces, and where they can be assured of some degree of security from enemy attacks (JDE, 1997:66).

*Support* is defined in joint publications as, “The action of a force that aids, protects, complements, or sustains another force....” (JP 1-02, 2003:510).

*Sustainment* is, “The provision of personnel, logistic, and other support required to maintain and prolong operations or combat until successful accomplishment or revision of the mission or the national objective” (JP 1-02, 2003:515). The joint dictionary further defines *logistics* as,

The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, those aspects of military operations which deal with: a. design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of materiel; b. movement, evacuation, and hospitalization of personnel; c. acquisition or construction, maintenance, operation, and disposition of facilities; and d. acquisition or furnishing of services (JP 1-02, 2003:309).

There is a thread that runs through these terms as defined in joint doctrine. Each term builds off the previous, expanding the scope of the linked terms and developing a general understanding of what BOS might be. From these five terms, it is apparent that BOS at least involves activities encompassing personnel and materiel in the provision of contracting, construction, supply, transportation, medical, and security services to maintain a platform for operations.

Moving on to the second grouping of terms, airfield, airhead, aerial port, are three terms that help define a framework of what AOS might be. The definition of *airfield*, “an area prepared for the accommodation (including any buildings, installations, and equipment), landing, and takeoff of aircraft,” (JP 1-02, 2003:19) is relatively general, but provides a basic understanding of the type of facility requiring support. Generally applicable only to expeditionary operating environments may be the definition of *airhead*: “a designated area in a hostile or threatened territory which, when seized and held, ensures the continuous air landing of troops and materiel and provides the maneuver space necessary for projected operations” (JP 1-02, 2003:20). A final term with influence on the eventual definition of AOS is *aerial port*: “an airfield that has been designated for the sustained air movement of personnel and materiel as well as an authorized port for entrance into or departure from the country where located” (JP 1-02, 2003:8).

The common thread of these three terms, airfield, airhead, and aerial port, is that they relate to the properties of a place where aircraft will operate. The

framework they provide is the genesis for a definition of AOS. AOS must provide the personnel, infrastructure, materiel, equipment, and services necessary to maintain mission capability, to facilitate aircraft operations.

From these definitions, general definitions for base and airfield operations support begins to form. BOS comprises the personnel and logistical activities necessary to protect and sustain a given operating location in support of a specified mission or objective. AOS, then, comprises those personnel and logistical activities inherently necessary to protect and sustain a given airfield in support of a specified mission or objective. It might be said that AOS is a subset of BOS for bases with airfields; a base does not require an airfield, but an airfield probably does require a base.

Before moving on to operational doctrine, several other terms must be defined. For instance, a *unified command* is “composed of significant assigned components of two or more Military Departments” and has a single commander known as a *unified* or *combatant commander* (JP 1-02, 2003:551). The Unified Command Plan, a Presidential-approved document, assigns and delineates geographic or functional responsibilities to these unified or combatant commanders (JP 1-02, 2003:551). When executing military action, unified commanders can either be the supported commander or the supporting commander. A *supported commander* is responsible for executing assigned tasks (JP 1-02, 2003:511) while a *supporting commander* is the unified commander who “provides augmentation forces or other support to a supported commander or who develops a support plan” (JP 1-02, 2003:511). A general

understanding of these terms is important when reviewing operational doctrine. In basic language, a geographic combatant commander is a unified commander designated by the President to command all US forces in a specific area. As a combatant commander, he may play two roles. As a supported commander, he is the warfighter. As a supporting commander, he provides forces and support to the warfighter.

Research next moved from definitional and reference doctrine to operational doctrine, the JP 3-0 publications. With a focus on AOS, the first publication reviewed in this series was JP 3-17, Joint Doctrine and Joint Tactics, Techniques, and Procedures for Air Mobility Operations. Chapter III, Section 5, Command and Control of Airfields During Contingency Operations, implies that it is the responsibility of the geographic combatant commander or his designated on-scene representative to determine priorities among competing US demands (JP 3-17, 2002:III-13). This goes to the heart of the issue surrounding both BOS and AOS: who is in charge, or more precisely, who is responsible for these mission critical tasks? “The supported commander establishes APOD [aerial port of debarkation] support activities, ensuring that adequate ramp space, fuel, communications infrastructure, and support is allocated for air mobility operations” (JP 3-17, 2002:VII-6). According to joint operational doctrine then, it is the responsibility of the geographic combatant commander to provide the necessary personnel and logistic support to ensure sustained operations are possible. The geographic combatant commander, however, does not have an organic force structure to which he can assign this task. The combatant

commander must assign the responsibility for AOS to one of his component forces, preferably based on the ability to accomplish the mission.

This notion of mission capability surfaces again in the next series of joint publications, JP 4-0, Logistics. According to the Executive Summary of JP 4-0, Doctrine for Logistic Support of Joint Operations,

the geographic combatant commanders are responsible for maintaining an effective distribution network...and positive control of personnel, materiel, and services....In contingency operations, one Service or agent is normally assigned base operations support responsibility for all Services in a particular area or base... (JP 4-0, 2000:vii).

This means that the combatant commander generally designates one service to provide support to all services operating in general proximity to each other.

The assignment of general support stems from the concept of common-user logistics (CUL), as described in JP 4-07, Joint Tactics, Techniques, and Procedures for Common-User Logistics During Joint Operations (2001).

*Common-user logistics* are “materiel or service support shared with...two or more services...” (JP 1-02, 2003:106). The goal of CUL is to eliminate duplication of effort by the services to support forces in the same area. When assigning CUL responsibility, the combatant commander has two options: assign the mission to the dominant user (JP 4-07, 2001:I-7) or to the most qualified service (JP 4-07, 2001:III-4). The concept of assigning CUL responsibility based on the capability of a service is an important one with operational consequences. Because the Army aviation focus is on helicopters, they may not be the best qualified service to provide support at an airfield launching and recovering a mix of strategic airlift and fighter aircraft. Likewise, the Air Force may not be the best qualified service



to provide vehicle maintenance support at a base where the primary activity involves tracked vehicles, i.e., tanks and armored personnel carriers. In summary, a combatant commander and his staff must examine the mission of the base in some detail and match the service charged with the support role with that mission. Assignment based solely on numbers of troops in the area may lead to incompatible or insufficient experience or capability to fulfill the support mission.

Airfield operating support (AOS) raises specific challenges for a combatant commander's staff, as well as for the assigned supporting service. Familiarity with assigned aircraft and airfield planning factors should be a prerequisite for assignment as the support force for airfield operations. For instance, in order to ensure successful airlift operations, planners must "...allocate sufficient air terminal ramp space, fuel, communications infrastructure, and ground support for airlift operations" (JP 4-07, 2002:VII-3 to VII-4). Where deficiencies occur, these planners "...should identify the need to develop, rehabilitate, and maintain facilities to maximize airlift support" (JP 4-07, 2002:VII-3 to VII-4). In regards to who should operate the facilities associated with airlift activities, JP 4-07 points out that AMC, as the air component of United States Transportation Command (USTRANSCOM), "is the single aerial port manager and, where designated, operator of common-user aerial ports..." (JP 4-07, 2001:II-12 to II-13). This designation makes the Air Force, specifically AMC, a logical choice for the combatant commander when designating a support force for AOS at a strategic

aerial port. Other support assignments may be as easy to identify. An additional question remains, however; whether or not AOS can be separated from BOS.

Continuing with the example of the aerial port above, joint doctrine does address a division of labor between airfield operations and the care and feeding of forces. An aerial port, as defined earlier, “can be divided into two parts: the air terminal operations, run by AMC; and the air terminal ‘support’ functions which are, in most cases, the responsibility of the supported component command” (JP 4-01.5, 2002:III-2). This is saying, if the Air Force is operating an aerial port for an Army deployment, then the Army is responsible for the “support” operations, which include reception, staging, and/or onward movement. “Reception is the supported commander’s responsibility” and “duties generally include health, welfare, and life support of arriving forces and assisting with their onward movement” (JP 4-01.5, 2002:III-13). In this example, AMC is providing some AOS, while the Army is responsible for the BOS. JP 4-01.5 draws a line between the care and feeding of forces and the aerial port operation. This distinction may be the doctrinal foundation for a division of BOS and AOS.

Some level of BOS and/or AOS can be provided through common-user logistics (CUL), as the above example demonstrates. Following is a brief review of the services’ abilities to provide CUL, as written in joint doctrine. JP 4-07 indicates that the Army has a majority of the military’s CUL capability; however, significant portions of this capability lie in the reserve components and take time to generate. In fact, the Army is required in some instances “to maintain specific CUL-related force structure” for the express purpose of support for the other

services. The Air Force, on top of providing common-user airlift and aerial port operations, maintains significant CUL capability for force beddown and base support, general engineering, and contracting. The limitations here are the number of available units and their requirement to support service-specific needs, first. Like the Air Force, the Navy boasts immensely capable general engineering and contracting, which are also limited in number. The Marine Corps does not generally provide CUL support. (JP 4-07, 2001:IV-5)

## **Task Lists**

Task lists address what the services should be capable of accomplishing. They are important to this research effort because they provide an insight into skills and capabilities the military intends to maintain. Finding tasks associated with providing support indicates the military believes support is a capability worth developing and training toward. This review begins with the Universal Joint Task List (UJTL), which is followed by reviews of the individual service task lists, providing a top-down look at military capabilities.

### ***Universal Joint Task List.***

The Universal Joint Task List (UJTL), written by the Joint Staff and released by the Chairman of the Joint Chiefs of Staff, provides "...a common language and common reference system...to communicate mission requirements" (CJCSM 3500.04C, 2002:A-1). In its truest sense, the UJTL tells each of the services what they are required to bring to the fight, in a language that everyone understands, despite the inherent differences of the services. As such, each

service must work with the UJTL and from it, develop their service specific mission task lists, always supporting and referring back to a task in the UJTL. Because the services are supposed to train as they fight, the UJTL is the foundation for all training requirements, not just operational employment. In fact, the stated purpose of the UJTL on its cover page is to provide “a standardized tool for describing requirements for planning, conducting, evaluating, and assessing joint and multinational training” (CJCSM 3500.04C, 2002:1).

Operationally speaking, “the [UJTL], when augmented with the Service task lists, is a comprehensive integrated menu of functional tasks, conditions, measures, and criteria” available to the Department of Defense in its execution of the National Military Strategy (CJCSM 3500.04C, 2002: A-1). The UJTL, and all supporting task lists, contain measures and criteria to judge the effectiveness of the force in meeting the assigned tasks. Commanders may select measures and criteria, making them the standard or level to which a certain task must be performed; however, commanders may set the measure and criteria according to the exercise or operation at hand. (CJCSM 3500.04C, 2002:A-1 to A-3)

“Commander’s approved measures and criteria of performance comprise the task standard to describe how well a joint organization or force must perform a joint task under specific set of conditions” (CJCSM 3500.04C, 2002: A-4). A measure establishes what will be evaluated in direct relation to a task; while “a criterion defines acceptable levels of performance” (CJCSM 3500.04, 2002:B-B-1), generally a minimum. By establishing standards, or proficiency levels, commanders are able to plan, conduct, and evaluate operations and training.

Measures and criteria accompany their respective task in the UJTL, and are numbered sequentially beginning with “M1”; however, the order in which they appear has no implied bearing on their relative importance (CJCSM 3500.04, 2002:B-B-4). Measures and criteria are merely guides and commanders are encouraged to develop their own and/or only use those that apply to their specific theater. For brevity, some measures were omitted; those provided have bearing on BOS or AOS. The measures listed are representative of the types of measures associated with a specific task.

The UJTL divides tasks into four distinct groups: strategic-national (SN), strategic-theater (ST), operational (OP), and tactical (TA) (CJCSM 3500.04C, 2002:B-1). These divisions are based on the three levels of war: strategic, operational, and tactical. Strategic-national refers to Department of Defense, Service, and interagency tasks, while strategic-theater refers to the tasks of a combatant command. Strategic level tasks “establish national and multinational military objectives; [...] define limits and assess risks for the use of military and other instruments of national power; [and] develop global plans or theater war plans...” (CJCSM 3500.04C, 2002:B-A-2). Operational tasks “ensure the logistics and administrative support of tactical forces...” (CJCSM 3500.04C, 2002:B-A-2). At the lowest level, tactical tasks are concerned with “the ordered arrangement and maneuver of combat elements in relation to each other and to the enemy to achieve combat objectives” (CJCSM 3500.04C, 2002:B-A-2).

The tasks in each group are numbered in a hierarchical fashion; single-digit listings are considered “category headings’, designating broad functional task

areas” (CJCSM 3500.04C, 2002:A-3). Task categories with two-, three-, or four-digits provide task specifics and generally are considered more appropriate for use by operational commanders (CJCSM 3500.04C, 2002:A-3). The categorization of tasks makes it easier to find certain types of tasks, such as support. Operational Task (OP) 4, for example, is the broad category for logistical and personnel support tasks. Any task with beginning with OP 4 will relate to logistical and personnel support, such as OP 4.4.2.2, Manage Personnel Accountability and Strength Reporting (CJSCM 3500.04C, 2002:B-C-C-77).

This research effort focused on the service component command’s ability, or expected ability, to perform BOS and/or AOS activities. Because service component commands do not generally deal with strategic national or strategic theater tasks, this effort concentrated on review of operational (OP) and tactical (TA) tasks (CJCSM 3500.04C, 2002:B-A-5). Only representative excerpts are included in this paper, as the OP and TA tasks comprise 187 pages of the 784 total pages in the UJTL. The provided excerpts are in near full text and to aid the reader’s understanding a glossary of abbreviations is provided at the end of this paper.

The following are excerpts of tasks, measures, and criteria from the UJTL that were found to apply in some degree to AOS or BOS. :

**OP 1.3.2 Enhance Movement of Operational Forces**

To prepare or improve facilities (for example, airfields, landing zones) and routes (for example, roads, railroads, canals, rivers, ports, port facilities, airfields) for moving operational forces in support of campaigns and major operations.

M4: Percent increase in APOD capacity for operational movement.

M6: Percent of airfields in JOA with approved approaches compatible with intratheater airlift and OAS aircraft.  
M8: Percent of airfields in JOA with approved precision approaches.  
M9: Percent of airfields in JOA with at least a 2 x C-130 MOG.  
M10: Percent of airfields in JOA with at least a 2 x C-5 MOG.  
M14: Percent of required follow-on forces accommodated by adequate APODs in lodgment area.  
M15: Hours strategic airlift diverted or canceled because airfields not prepared sufficiently.  
M16: Days to achieve POD throughput to allow meeting of RDDs. (CJCSM 3500.04C, 2002:B-C-C-25).

#### OP 4 Provide Operational Logistics and Personnel Support.

To provide logistics and personnel support activities required to sustain the force in campaigns and major operations within the joint operations area. The logistic concept should support theater activity by properly organizing support from the CONUS base to the combat zone. At the theater operational level, specific considerations include identification of operational requirements and establishment of priorities for the employment of the resources provided. This theater of operations/joint operations area sustaining base, which includes the communications zone, links strategic sustainment to tactical CSS. In military operations other than war, the activities under operational support also pertain to support of US forces, other USG agencies, and forces of friendly countries or groups being supported by US forces. Operational support includes sustaining the tempo and the continuity of operations throughout a campaign or major operation. This task includes obtaining sustainment support from sources other than Military Services and includes the following: host-nation support, logistic civil augmentation, DOD civilian support, and captured materiel.

M2: Tons of backlogged support requirements.  
M3: Percent of required logistics in place to support campaign.  
M4: Days of supply in theater.  
(CJCSM 3500.04C, 2002:B-C-C-71).

#### OP 4.4.1 Coordinate Field Services Requirements

To coordinate field services and supplies requirements in support of personnel (including food, water, personal welfare and comfort items; clothing and individual equipment; laundry, bath, and renovation; and mortuary affairs) in the joint operations area.

M1: Days to access to laundry and bath facilities.  
M2: Days to obtain delivery of mail to unit level.

M3: Days delay in search, recovery, identification, care, and evacuation or disposition of deceased personnel (due to lack of graves registration system, units).  
M5: Percent of personal daily water requirement being provided.  
M6: Percent of personnel provided with required individual clothing and equipment.  
M7: Percent of personnel receiving at least one hot meal per day.  
M8: Months to establish MWR/USO facilities in protracted operation.  
M9: Weeks to establish joint mortuary affairs office.  
(CJCSM 3500.04C, 2002:B-C-C-71).

#### OP 4.4.3 Provide for Health Services in the Joint Operations Area

To provide health service support in the operational area to include, but is not limited to: health services resources; preventive and curative health measures; patient evacuation; return to duty determination; blood management, medical logistics; combat stress control, medical, dental, veterinary, ancillary services, optometry, medical food supply, and medical intelligence services. This task includes actions of the Theater Patient Movement Requirements Center (TPMRC) and the Joint Blood Program Office (JBPO). In addition, this task could include quarantine actions in coordination with civil authorities.

M1: Percent of personnel accounted for in treatment pipeline.  
M2: Percent of casualties returned to duty.  
M3: Percent of casualties die.  
M4: Per/day provided medical treatment.  
M5: Hours to begin surgery after receiving a wound or injury.  
(CJCSM 3500.04C, 2002:B-C-C-77).

#### OP 4.6 Build and Maintain Sustainment Bases in the Joint Operations Area.

To build and maintain principal and supplementary bases of support for the JOA sustainment activities in conformance with geographic combatant commander's guidance. This task also includes coordinating common administrative and interservice support for the minimum essential facilities to house, sustain, and support normal or contingency operations from a garrison, base, or bare base site. It may include, if required, a stabilized runway, taxiways, and aircraft parking areas. Lead or dominant service component assigned by the combatant commander provides common servicing or cross servicing (reimbursable or otherwise) as required.

M1: Days between arrival of building supplies and equipment and construction of sustainment facilities.  
M2: Percent of facilities adequately maintained.  
M3: Percent of overall cargo and equipment deliveries accommodated by sustainment base.



M4: Square feet/day of permanent facilities emplaced or constructed.  
M8: Days to complete construction of sustainment facilities.  
M9: Days to initiate construction of facilities from final project approval.  
M12: Days to have assets at requesting location.  
M13: Days to have bases identified in OPLAN operational.  
(CJCSM 3500.04C, 2002:B-C-C-85).

#### OP 4.6.2 Provide Civil-Military Engineering

To dismantle fortifications and to construct and maintain facilities and communications networks that give physical structure to the lines of communication. This activity includes the following: building/maintaining forward staging bases; restoring rear to include sustainment infrastructure, such as repair of water supply and sewage treatment structures; area, sustaining LOC; supporting construction; and acquiring or producing construction material. Environmental protection and restoration will be accomplished in accordance with DOD environmental policy, SOFAs, international treaties, and other binding guidance to which the US Government is a party.

M1: Percent of supplies under weatherproof cover.  
M2: Percent of tasks correctly assigned (correct engineers/location/time).  
M3: Percent of theater level maintenance facilities protected from elements.  
M4: Days to construct theater field hospital after forces identified and marshaled.  
M5: Days to reestablish damaged LOCs.  
M6: Days to restore essential utilities in rear areas.  
M7: Days to restore APOD to handle required shipping.  
(CJCSM 3500.04C, 2002:B-C-C-86 to B-C-C-87).

#### OP 4.6.3 Expand Capacity of Ports of Debarkation and Allocate Space in the Joint Operations Area.

To increase the capacity of ports of debarkation in operational areas to accommodate the throughput necessary to support the joint forces and multinational forces campaign, major operations, and routine support requirements. To acquire, maintain, and parcel out to subordinate organizations the real estate to conduct operations and provide services.

M1: Tons/Day increase in POD throughput capacity (to support current operation).  
M2: Days to achieve required POD clearance capacity.  
M3: Days to expand POD throughput capacity to meet required levels.  
(CJCSM 3500.04C, 2002:B-C-C-87).

TA 4 Perform Logistics and Combat Service Support

To sustain forces in the combat zone by arming, fueling, fixing equipment, moving, supplying, manning, maintaining visibility over, and by providing personnel and health services. [...] (CJCSM 3500.04C, 2002:B-C-D-15).

TA 4.2 Distribute Supplies and Provide Transport Services

Provide force sustainment. Distribute supplies and provide transport services to sustain forces and enable continuity of tactical operations in the combat zone (AO) by arming, fueling, fixing equipment, moving, supplying, manning, maintaining visibility over, and by providing personnel and health services.

M1: Percent of operations degraded, delayed, or modified due to delays in moving or evacuating personnel, supplies, and equipment.

M2: Percent Of required operations properly sustained.  
(CJCSM 3500.04C, 2002:B-C-D-15).

These nine excerpts from the UJTL provide considerable insight into the support capabilities the Joint Staff believes the military should possess and train toward. These excerpts cover a broad range of activities which generally fall within the scope of the definitions discussed in the review of joint doctrine. Further, most of these tasks fall within the scope of the general definitions developed for BOS and AOS. The UJTL, however, does not provide a specific task for the provision of BOS or AOS.

***Air Force Task List.***

The Air Force developed its task list using the UJTL as a guide. Each service customizes the task list to conform to its specific missions, roles, and functions. Air Force Doctrine Document 1-1, Air Force Task List (AFTL), therefore, is founded on the Air Force's six core competencies and command and control, which is integral to operational success (AFDD 1-1, 1998:4). The AFTL is

designed to be the basis behind unit long range planning, and provides a vocabulary upon which to build operational, functional, and task compliance programs (AFDD 1-1, 1998:16).

The numbering hierarchy of the AFTL is similar in organizational construct to the UJTL, in that single-digit task categories reflect broad functional areas and two-, three-, and four-digit tasks provide additional task detail. An example similar to the one provided for the UJTL concerning support would be the AFTL's Air Force Task (AFT) 6, Agile Combat Support. Personnel accountability is included under AFT 6.6.1.7, Total Asset Visibility.

Also formatted and numbered similarly to the UJTL, the AFTL includes measures and criteria with each respective task. As was done with the UJTL, only excerpts of those tasks pertaining to BOS and/or AOS are included. Representative measures and criteria are included to provide a basic understanding of the level or standard of performance that can be expected. The excerpts are provided in near full text so a glossary or acronyms is provided at the end this paper to assist the reader.

The following are excerpts from Air Force tasks related to the execution of AOS and/or BOS activities:

Air Force Task (AFT) 6 Provide Agile Combat Support.  
To provide highly responsive force support. A force that is poised to respond to global taskings within hours must also be able to support that force within hours. This includes all elements of a forward base structure: maintenance, supply, transportation, communications, services, personnel, engineering, force protection, medical, and chaplain service. Air Force commanders in each of these areas must not only assist the joint combatant commander in generating aerospace power, but also

insure their respective systems form a seamless, agile, and responsive combat support system. [...]

M1: Time to provide required combat support.

M2: Percent of required combat support provided.

M3: Degree to which provided combat support contributes, or fails to contribute, to achieving Air Force objectives.

M4: Cost to provide agile combat support.

(AFDD 1-1, 1998:122).

#### AFT 6.2.1 Protect the Force.

To meet global mission requirements with a responsive, sustainable, and survivable support force prepared to promote and defend national interests.

M1: Time to [...] protect the force capabilities when required.

M3: Percent effectiveness of protective positions, measures, or equipment to reduce adverse effects from the conduct of military operations.

M4: Percent effectiveness of measures taken for the force to remain viable and functional by protecting itself from the effects of or recovery from enemy activities and natural occurrences.

M5: Cost to protect the force.

(AFDD 1-1, 1998:132).

#### AFT 6.4 Provide the Capability to Position the Force.

To organize, train, equip, provide, and plan for the use of forces to deliver forces tailored and phased that contribute to the effective employment of aerospace power. It includes tailoring force packages, preparing personnel and weapons/support systems for deployment and employment, deployment of forces, reception of personnel and materiel, and their integration back to operational capable forces. Reception involves, offloading, movement to operating locations, and beddown activities. These activities support the beddown of aircraft, personnel, and infrastructure support. These activities must be concentrated on quickly integrating personnel and equipment for immediate operations.

M1: Percent of forces organized to deliver forces tailored and phased that contribute to the effective employment of aerospace power.

M2: Percent of forces trained to deliver forces tailored and phased that contribute to the effective employment of aerospace power.

M3: Percent of forces equipped to deliver forces tailored and phased that contribute to the effective employment of aerospace power.

M4: Percent of requested forces provided to deliver forces tailored and phased that contribute to the effective employment of aerospace power.

M5: Degree to which forces are capable of delivering forces tailored and phased that contribute to the effective employment of aerospace power.  
(AFDD 1-1, 1998:139-140).

#### AFT 6.5 Provide the Capability to Employ the Force.

To organize, train, equip, provide, and plan for the use of forces to generate operational capabilities by integrating support systems. Force employment allows for the operational mission to be completed through the support of all those systems designed to generate people and systems in the operational area. Operations should commence even while additional combat support is received and integrated, and the necessary infrastructure is assembled. Initial force employment requires management of generation resources; personnel support; command, control, and intelligence; and security. It ultimately results in a smooth transition from peacetime to contingency tempos.

M1: Percent of forces organized to generate operational capabilities by integrating support systems.

M2: Percent of forces trained to generate operational capabilities by integrating support systems.

M3: Percent of forces equipped to generate operational capabilities by integrating support systems.

M4: Percent of requested forces provided to generate operational capabilities by integrating support systems.

M5: Percent degree to which forces are capable of generating operational capabilities by integrating support systems.

(AFDD 1-1, 1998:142).

#### AFT 6.5.1.3 Perform Air Mobility Support.

To provide air mobility support operations essential to the deployment, sustainment, and redeployment phases of operations. This task includes activity to expand or establish air mobility support presence and infrastructure at locations throughout the world.

M1: Time to provide air mobility support operations.

M2: Degree of capability to provide air mobility support operations.

M3: Percent of required air mobility support performed within specified timelines.

M4: Cost to perform air mobility support.

(AFDD 1-1, 1998:143).

#### AFT 6.6 Provide the Capability to Sustain the Force.

To organize, train, equip, provide, and plan for the use of forces to enable continuity of operations throughout mission duration. Sustainment is a key to successful operations. The faster materiel sustainment can begin, the fewer supplies a deployed unit must initially take with them. This allows

for a smaller deployment footprint, a basic Agile Combat Support goal. Throughout an operation's sustainment phase, force protection and support services, such as chaplain, legal, medical and personnel support, must continue, both for deployed personnel and for those remaining at home station.

M1: Percent of forces organized to enable continuity of operations throughout mission duration.

M2: Percent of forces trained to enable continuity of operations throughout mission duration.

M3: Percent of forces equipped to enable continuity of operations throughout mission duration.

M4: Percent of requested forces provided to enable continuity of operations throughout mission duration.

M5: Degree to which forces are capable of enabling continuity of operations throughout mission duration.

(AFDD 1-1, 1998:144-145).

As discussed previously, a number of additional, more detailed tasks support each of the single and two digit tasks listed in the Air Force Task List. These supporting tasks provide greater definition and opportunity for measurement. For instance, immediately below AFT 6.6, above, appears AFT 6.6.1 Sustain the Force. Supporting this task are thirteen additional tasks including: perform logistic support; perform communication and information support activities; provide chaplain service support; perform medical support activities; perform civil engineering support; and provide services support (AFDD 1-1, 1998:145-149).

Like the excerpts from the UJTL, the AFTL does not contain a specific task for base or airfield support. These excerpts and their subordinate tasks, however, do fulfill many of the support definitions reviewed in joint doctrine. What these excerpts do show is a commitment by the Air Force to develop a support capability across a broad spectrum of activities which relate to BOS and AOS.

### ***The Universal Naval Task List.***

Navy, Marine Corps, and Coast Guard tasks are combined in a single document, and published as The Universal Naval Task List. The Navy's measures and criteria do not accompany each task description, but rather are listed in a separate appendix under only the task number and title. The Navy followed the UJTL numbering and sequencing format, having the same four divisions of tasks along the three levels of war with a subdivision between strategic-national and strategic-theater. The Navy operational level (OP) tasks read virtually verbatim of the UJTL operational tasks. This review therefore focuses on the tactical naval force tasks to get an accurate understanding of the Navy's capabilities. Again, a glossary of acronyms is provided at the end of this paper. As with the UJTL and the AFTL, only a representative selection of measures are included to provide a flavor of the intended standard to which a task will be performed.

The following are naval force tactical tasks (NTA) relevant to BOS and/or AOS:

NTA 1.5.5.8.2 Construct/Repair Forward Airfields and Landing Zones.  
To prepare or repair landing zones, expeditionary airfields, landing strips to support aviation ground facility requirements in the forward battle area.  
M1: Day to construct, improve, or repair required airfields and LZs.  
M4: Hours delayed in executing plans due to required route construction or repair. (UNTL, 2002:3-428,5-33)

NTA 4 Perform Logistics and Combat Service Support.  
To sustain forces in the combat zone by arming, fueling, fixing equipment, moving, supplying, manning, maintaining visibility over, and by providing personnel and health services. Includes logistic support, as necessary, to US agencies and friendly nations or groups.  
M1: Days of supply in theater.  
M2: Tons of backlogged support requirements.  
M3: Number of backlogged support items.

M4: Percent of required logistics in place to support campaign.  
M5: Days from request until items are received in theater. (UNTL, 2002:3-441,5-53).

#### NTA 4.2 Fuel.

To provide fuel and petroleum products (petroleum, oils, and lubricants) to ships, aircraft, weapon systems, and other equipment. Note: NTA 4.5, *Provide Transport Services* (to provide class III supplies and services to military units by employing transportation and supply services) applies to this task.

M2: Percent of daily Class III provided by host nation.  
M3: Days of operational delay due to fuel shortages.  
M5: Gallons per day of required fuel delivered to theater.  
M15: Percent of needed fuel transferred. (UNTL, 2002:3-441,5-54)

#### NTA 4.3 Repair/Maintain Equipment.

To preserve, repair, and ensure continued operation and effectiveness of units (ships, aircraft, ground forces, weapons systems, and their equipment). It includes the policy and organization related to the maintenance of equipment (afloat and ashore); development of maintenance strategies; standards of performance for both preventive and corrective maintenance; technical engineering support; provision of repair parts and end items; and battle damage repair.

M3: Average equipment downtime, days.  
M4: Average equipment downtime, percent.  
M6: Percent of equipment deadlined for maintenance.  
M7: Percent of equipment deadlined for supply.  
M14: Hours to obtain replacement parts, once they are identified.  
(UNTL, 2002:3-442,5-56).

#### NTA 4.4 Provide Personnel and Personnel Support.

To provide support to units and individual Service members, as well as providing units with trained, healthy, fit personnel.

M3: Percent of unit personnel requirements are provided at D-day.  
M6: Percent of personnel support can be contracted.  
M7: Days to obtain replacement personnel and assign to unit.  
(UNTL, 2002:3-444,5-59).

##### NTA 4.4.2 Perform Fleet/Field Services.

To perform logistic service tasks for units in the theater, to include clothing exchange and shower/bath, mail, laundry, and food services.

M1: Percent of personnel provided with required individual clothing and equipment.  
M2: Days between access to laundry and bath facilities.



M4: Percent of personnel receiving at least one hot meal per day.  
M5: Percent of personal daily water requirement provided.  
(UNTL, 2002:3-445,5-60).

#### NTA 4.4.3 Perform Personnel Administrative Service Support.

To support forces with personnel administration, financial, and resource management services; religious ministry support activities; and public affairs and legal services.

M7: Of personnel sitreps submitted on time.

M8: Days to process and distribute mail after receipt by unit.  
(UNTL, 2002:3-446,5-61).

#### NTA 4.4.4 Perform Financial Services.

To perform financial services for military personnel, civilians, and foreign nationals. These services include commercial accounting, pay disbursement, accounting, travel pay, and financial technical advice and guidance.

M1: Number of transactions performed.

M3: Dollars processed per day.

M4: Percent of personnel with access to adequate financial support services.

M5: Percent of audit sample have an account error.

M7: Number of disbursing corrective actions required per 1000 customers. (UNTL, 2002:3-446,5-61).

#### NTA 4.4.5 Advise Command on Religious, Spiritual, Moral, and Morale Issues.

To advise the commander on matters of religion, moral, and morale concerns. To provide religious support and provide religious program personnel both ashore and afloat. To evaluate and assist Command Religious Programs under the commander's authority.

M1: Number of services provided.

M2: Percent of personnel with services available.

M3: Percent of religions/denominations provided services.

M4: Days from request for counseling to appointment.

M5: Percent of requests for counseling receive appointments.  
(UNTL, 2002:3-446,5-61).

#### NTA 4.5 Provide Transport Services.

To distribute logistic support in the form of material, support services, and personnel to military units and others by employing transportation services. To move materiel or personnel by towing, self-propulsion, or carrier via any means, such as railways, highways, waterways, pipelines, oceans, Logistics Over The Shore (LOTS), Joint LOTS (JLOTS), and airways. This task includes technical operations and moving and evacuating cargo, personnel, and equipment. At aerial and sea ports of debarkation, responsibilities of

transportation support include off-load, operational control of the ports and beaches, and management of the throughput.

M1: Days of operational delay due to late arrivals.

M2: Percent of fire [i.e., artillery or ship gun battery] missions delayed or canceled due to ammo shortfall.

M3: Percent of required support material distributed during execution at the time and place required.

M4: Percent of total supplies moved in JOA.

M6: Percent of supplies sent to correct destination.

(UNTL, 2002:3-447,5-61 – 5-62).

#### NTA 4.5.1 Load/Off-Load, Transport, and Store Material.

To provide mobile, long-term prepositioning and short-term deployment/redeployment of unit equipment and supplies in support of designated elements. Includes Afloat Prepositioning Shipping (APS) for land forces and Expeditionary Prepositioning Shipping (Maritime Prepositioning Forces (MPF)) for expeditionary forces and forces to off-load that shipping (ELSF and CH Battalion). To provide strategic sealift in support of the rapid deployment of heavy mechanized combat units, for movement of an Aviation Intermediate Maintenance Activity (IMA) to a contingency area to support a designated mix of fixed-wing, tilt-rotor, and helicopter aircraft in an expeditionary environment, and to provide crane ships or other services to discharge cargo in less developed or war damaged ports on a worldwide basis. Includes management of the inventory

M1: Number of passengers per day transported in support of operations.

M2: Ton miles of supplies and equipment transported per day.

M3: Hours to establish a Joint Movement Center upon arrival.

M4: Percent of scheduled transport movements accomplished on schedule.

M5: Hours until offload completed after arrival.

(UNTL, 2002:3-447,5-62).

#### NTA 4.5.5 Provide Materials Handling Equipment (MHE).

To provide specialized mechanical devices to assist in rapid handling (off-loading aircraft, landing craft, and shipping, and up-loading to other means of transportation or storage) of supplies, materiel, and equipment.

M1: Hours to attain all required MHE.

M2: Percent of authorized MHE. (UNTL, 2002:3-447,5-62).

#### NTA 4.6 Supply the Force.

To receive, store, issue, and resupply materiel for military units and others. Includes contracting, receipt, storage, inventory control, and issuance of end items, repairable and consumable materiel, and management of retrograde both at sea and ashore.

M2: Days late to deliver replenishment stocks.  
M3: Days of supplies stockpiled to support campaign.  
M4: Percent of required reception and onward movement support available at the time and place required.  
M10: Percent of constraints/shortfalls in supply with alternatives.  
M13: Percent of planned supplies actually delivered.  
(UNTL, 2002:3-448,5-62).

#### NTA 4.7 Perform Civil Military Engineering Support.

To repair and construct facilities and lines of communication, and to provide water and utilities.

M3: Time to restore essential utilities in the rear areas.  
M4: Time to reestablish damaged LOCs.  
M5: Time to restore POD/APOD to handle required shipping.  
M6: Percent of tasks correctly assigned (right engineers/location/time).  
M7: Percent of maintenance facilities under weatherproof cover.  
M8: Percent of supplies under weatherproof cover at sustainment bases. (UNTL, 2002:3-449,5-64).

#### NTA 4.12 Provide Health Services.

To preserve, promote, improve, conserve, and restore the mental and physical well-being of the force and other designated populations. This task includes providing emergency and routine health care to all personnel; advising commanders on the state of health, sanitation and medical readiness of deploying forces on a continual basis; maintaining health and dental records; keeping a current mass casualty plan; training personnel in basic and advanced first aid; maintaining medical intelligence information files; implementing preventive medicine measures; and ensuring combat readiness of health care personnel assigned to various wartime platforms through continuous training.

M1: Percent accountability of personnel entering the health services pipeline.  
M2: Hours from wound or injury until person is in surgery.  
M3: Percent of casualties returned to duty.  
M4: Percent of casualties die.  
M5: Military personnel per day provided medical treatment.  
(UNTL, 2002:3-454,5-69).

#### NTA 5 Exercise Command and Control.

To exercise authority and direction over assigned or attached forces in the accomplishment of a mission. C2 involves maintaining visibility over and arranging personnel, equipment, and facilities during the planning and conducting of military operations.

M1: Hours prior to execution OPLAN published, delivered to units.

M2: Percent of units receiving their orders on schedule.  
M3: Percent of units at desired position and appropriate degree of readiness at execution.  
M4: Percent of communications nodes in place.  
(UNTL, 2002:3-457,5-74).

NTA 6.3.1.2 Protect/Secure Operationally Critical Installations, Facilities, and Systems.

To protect operationally critical installations, facilities, and systems from attack in the operational area.

M1: Incidents of hostile acts against US forces.  
M3: Time for reaction force to reach an installation or facility under attack.  
M5: Percent of critical friendly forces hardened or protected against hostile acts.  
M8: Percent of attacks that penetrate security in operational area.  
M9: Percent of hardened communications in operational area.  
M10: Percent of communications in operational area with alternate routing.  
M11: Time to restore installation, facility, or system to full capacity following an incident. (UNTL, 2002:3-471,5-93).

The UNTL, like the UJTL and the AFTL, does not include a specific task for either BOS or AOS. The UNTL excerpts, however, do provide appropriate tasks to fulfill many of the requirements of the definitions of support activities discussed in the joint doctrine review. These excerpts indicate the naval services, like the Air Force, are committed to performing support across a broad spectrum of activities.

As stated previously, the UNTL encompasses tasks for all three naval services: the Navy, the Marine Corps, and the Coast Guard. The document, however, does not delineate which tasks will be performed by which of the three naval services. Therefore, to properly employ a given naval service, a joint force commander must either refer to a complimenting document for more specific guidance, or pull from anecdotal experience. Additional research, including a

query of the Naval Doctrine Center failed to locate a complimenting document.

Without such reference or experience from which to draw, a joint force commander may inappropriately assign a support task to one of the naval services, placing mission success in jeopardy.

### ***The Army Universal Task List.***

The Army Universal Task List (AUTL), Field Manual (FM) 7-15, is an unpublished, draft document, without precedent. As such, FM 7-15 is not considered to be doctrine by the Army. According to the FM 7-15 office of primary responsibility at the Army's Combined Arms Center, the draft will be published as-is, with the exception of sections pertaining to military police and military intelligence which remain in dispute (Darling, 2003).

The AUTL, like the AFTL, does not follow the numbering convention used by the UJTL, so numerical correlation of tasks is not possible. Additionally, the Army believes the UJTL includes all joint or multinational strategic and operational tasks, and therefore the AUTL only includes tasks that Army forces perform at the tactical level (AUTL:ix). The AUTL then is a single level of war compendium, housing a "comprehensive listing of Army tactical-level tasks, missions and operations" founded in doctrine (AUTL:ix). The Army tactical tasks (ART) are divided into eight chapters. The first seven are based on the Army's seven battlefield operating systems: intelligence, maneuver, fire support, air defense, mobility/countermobility/survivability, combat service support, and command and control (AUTL:x). The eighth chapter comprises Army doctrinal tactical missions and operations that incorporate combined arms (AUTL:x). Like the other task lists, the AUTL "provides a common language and reference system for doctrine, combat, and training developers. The link between planners and trainers helps ensure that forces train the way they will fight" (AUTL:xi).

A review of the AUTL with reference to BOS and/or AOS activities revealed very similar tasks as those found in the AFTL and the UNTL, with varying degrees of syntax and service specific nuances. Instead of listing all the relevant tasks, only a few tasks were selected from two of the battlefield operating systems to demonstrate the differences and similarities among the services. Because the excerpts are provided in near full text, a glossary of acronyms is provided at the end this paper to assist the reader.

The following tasks were taken from the Mobility/Counter mobility/Survivability (5.0) and the Combat Service Support (6.0) battlefield operating systems:

Army Tactical Task (ART) 5.1.2 Enhance Movement and Maneuver  
5-8. Enhance force mobility in the forward area by constructing or repairing combat roads, trails, and forward airfields and landing zones to facilitate the movement of personnel, equipment, and supplies. Note: Mobility enhancing systems referred to in this task include, but are not limited to: bulldozers, road graders, armored combat earthmovers, dump trucks, cranes, scoop loaders, and explosives used to remove obstacles.

9. Time to complete mobility enhancing activity.

11. Percent of mobility enhancing activity complete.

12. Percent of mobility enhancing systems available to the commander that are committed to the task.

14. Number of mobility enhancing systems that are mission capable. (AUTL:5-7 – 5-8).

ART 5.1.2.2 Construct/Maintain Forward Airfields and Landing Zones (LZ)  
5-10. Prepare and maintain landing zones and landing strips to support Army and joint aviation ground facility requirements.

1. Yes/No: Complete forward airfield/landing zone construction/maintenance effort within the period the order specifies.

2. Time to respond to an event that negatively impacts the capability of existing forward airfields and landing zones.

6. Time to plan for the construction/repair for forward airfields/LZs.

9. Time to complete construction/repair of the forward airfield/LZ.

11. Percent of forward airfield/LZ construction/repair completed.

(AUTL:5-9 – 5-10)

ART 6.0 The Combat Service Support (CSS) Battlefield Operating System

The Combat Service Support (CSS) battlefield operating system is the support and services to sustain forces during full spectrum operations. It includes many technical specialties and functional activities. These include the functions within the Army's framework of CSS (FM 4-0): supply, maintenance, transportation, combat health support, human resource support, legal support, finance, religious support, contracting support, distribution management, field and other service support as well as general engineering. The CSS battlefield operating system includes all aspects of civil-military operations falling under the general U.S. Joint Staff definition of force sustainment (JP1-02). The supported force may be joint, multinational, or interagency in nature. Army forces may also provide CSS to contractors, civilians (including refugees and disaster victims), or members of nongovernmental organizations (NGOs). (AUTL:6-1)

Under the CSS battlefield operating system, there are 14 direct support tasks including: provide supplies; provide maintenance; provide field services support; and provide contracting support. Two are included to demonstrate the similarities and differences of these tasks and those of the other services. The similarities are very strong; the primary differences are in the detail of the measures.

#### ART 6.10.2.5 Construct and Expand Airfield Facilities

6-137. Provide for planning military airfields; new airfield and heliport construction, expansion and rehabilitation; and maintenance and repair of airfields and heliports in the AO.

01 Yes/No: An ability to construct or expand airfield facilities [without degrading or delaying] unit operations.

04 Yes/No: Airfield/helipad project(s) completed on time.

15 Time to conduct sub grade and base-course operations.

16 Time to stabilize soil and provide dust control if required.

17 Time to install surface matting, if required.

18 Time to conduct airfield marking operations.

19 Time to install airfield lighting.

23 Time that scheduled arrivals in AO are delayed on the average due to interruptions in the construction/expansion/maintenance of airfield/helipad facilities by combat actions or natural disasters.

25 Percent of force becoming casualties due to enemy action or accidents during the construction or maintenance of airfields/helipads.



26 Percent increase in the throughput capability of an airfield/heliport due to the construction or maintenance of aviation support facilities.

27 Percent of planned airfield/helipad construction/maintenance capability achieved.

28 Percent of personnel in AO required to construct and maintain airfields, heliports, and their associated aviation support facilities.

30 Percent of existing airfields/helipads and their associated aviation support facilities improved in AO.

32 Percent of unit operations degraded, delayed, or modified in AO due to an inability to use existing airfields/helipads.

34 Percent of existing logistic facilities with access to existing airfields/helipads.

40 Number of instances of delays in scheduled arrivals due to the destruction or damage of airfields and helipads within the AO by combat actions or natural disaster.

41 Number of instances in which troop movement or sustaining operations were prevented due to an inability to use airfields/helipads and associated aviation support facilities.

42 Number of tons per day of supplies transported by aviation platforms within the AO.

43 Number of passengers per day transported by aviation within the AO.

44 Number of inspections of aviation support infrastructure conducted per month within the AO. (AUTL:6-99 - 6-101)

#### ART 6.12 Provide Distribution Management

6-148. Plan and synchronize the time-definite delivery of materiel, equipment, units, personnel, and services to and within the AO.

01 Yes/No inability of the distribution system to get the right supplies to the right unit at the right time does not delay, degrade or prevent unit operations.

02 Time to set up transportation modes within theater.

03 Percent of required items of supply transiting the distribution pipeline.

04 Percent of visibility and control maintained over the distribution pipeline within and external to the AO.

05 Percent of unit operations delayed, degraded, or modified due to lack of any or all classes of supply.

06 Percent flexibility to provide resources from host nation or other agencies.

09 Percent [of time or assets] able to maintain In-transit visibility of distribution pipeline, and assets flowing through pipeline. (AUTL:6-114 – 6-115).

As seen with the other task lists, these excerpts cover a broad range of activities which fall within the parameters of BOS and AOS, but there are not specific tasks for either. Also, like the other services, the Army appears committed to having broad spectrum support capabilities developed in its force structure.

Overall, all the task lists support the BOS and AOS-related definitions found in joint doctrine. The services have many tasks in common, differentiated only by minor service nuances in syntax. This commonality supports the initiative behind the assignment of common-user logistics (CUL) to eliminate duplication of effort on the part of the services supporting respective forces in the same area of operations. Proficiency or the acceptable standard to which a particular service is able to perform a specified support task remains a concern when assigning support roles to the services. Observations, often referred to as lessons learned, lend credibility to this concern, and comprise the next portion of the literature review.

## **Lessons Learned**

### ***Overview.***

This section of the chapter addresses lessons learned submitted by military members participating in field operations and exercises. Lessons learned are an important part of this research effort because they provide first-hand accounts of the failings of current doctrine, procedures, and practices. Understanding when,

where, and why a system or organization fails is vital to correcting the problem and avoiding continued failure or loss of efficiency.

A number of Department of Defense (DoD) agencies collect, sort, catalog, and analyze lessons learned. In theory, the analysis of lessons learned can result in changes in operating procedures, performance standards, and even doctrine. In practice, many lessons learned are better described as lessons observed. They are collected, filed, and forgotten instead of being studied or used to produce improvement. Because lessons learned often point to a weakness in military operations that could be exploited by an adversary, many lessons learned and their collective databases are classified. This makes future use or study of these lessons more difficult because routine access is made more difficult by classification.

Research did reveal numerous classified lessons learned that applied to support activities. The applicability of the classified lessons learned to this research effort is adequately represented by those observations that were not classified. A majority of the observations that were classified received such protection because of an association with a classified operation more than the support activity being of a sensitive nature. The lessons learned referenced in this section are all unclassified.

#### ***Joint Universal Lessons Learned System.***

The joint intelligence community utilizes lessons learned databases to aggregate and evaluate feedback, prior to preparing reports for future operations.

The Joint Universal Lessons Learned System (JULLS) provides a means for personnel participating in joint operations and exercises to share with other organizations the problems encountered and the solutions developed to overcome those problems (JP 2-0, 2000:II-14).

Research found several JULL reports relevant to AOS and/or BOS. One JULL report titled “Definition of Base Operating Support” provided the observation that “There is a great deal of confusion over the definition of base operating support and who is responsible for what” (JULLS, 2002:#30537-08964). This observation, made by a member of the special operations community, points to problems encountered at Kandahar, where the 101<sup>st</sup> Airborne Division was responsible for BOS. Special operations forces (SOF) were instructed to beddown at Kandahar and expected support from the host BOS provider, but found that the 101<sup>st</sup> Airborne Division was not equipped to support even their own forces, let alone additional tenants (JULLS, 2002:#30537-08964).

A basic and universal definition of BOS provides a common understanding of what it means to be assigned BOS responsibility, which in turn allows the provider to plan for and prioritize requirements. Another JULL report, titled “Forward Logistics Operating Bases” observed that “A developing, non-linear theater of operations requires different base operations support than a mature theater” (JULLS, 2002:#89939-41525). Essentially, the lack of stable or established front lines necessitated the development of multiple logistic support bases that would allow the projection of force into dispersed locations. The Combined Forces Land Component Commander (CFLCC) had assigned BOS responsibility for several of the major sites to the Army. Later, the CFLCC

discovered that traditional Army support units were unable to move their equipment and personnel to these sites because of limitations in the theater transportation system. This necessitated the rapid development of impromptu support organizations that could access the sites and provide basic support services. The lack of flexibility in traditional Army support organizations resulted in a delay in basic services arriving at locations like Kandahar, as noted in the first JULL report above. (JULLS, 2002:#89939-41525)

Two other JULL reports focused on an AOS issue: the ability to rapidly repair airfield pavements to support inter and intra theater airlift. “Expedient Runway Repair/Construction Capability” discusses the requirement for the basic capability to repair airfields damaged either by denial efforts of the enemy or by allied action against the airfield during prior hostilities in the case of a seized airfield. The ability to repair the damage and allow allied aircraft to begin airlift operations into remote or austere airfields was critical to continued efforts in Afghanistan. The re-opening of airfields like Bagram and Kandahar facilitated the concentration of forces closer to the enemy, and staging locations for continued assault operations. The Army’s inability to adequately perform rapid runway repair (RRR) and the tremendous capability exhibited by British forces generated a desire in some circles for the Army to establish a RRR capability (JULLS, 2002:#38023-80258). The other report simply states that RRR assets must be staged closer to the fight and prioritized higher in the deployment order to better facilitate base opening and the introduction of follow-on forces. The Army’s inability to rapidly repair airfields at Kandahar and Bagram “...slowed the

introduction of security forces and sustainment engineers to establish base camps” (JULLS, 2001:#21059-64573).

### ***Navy Lessons Learned.***

The Navy Warfare Doctrine Center is another agency that collects and reviews lessons learned. Research of their database uncovered several reports relevant to this research effort. Titled “Coordinating Sorties into an Expeditionary Airfield,” the 26<sup>th</sup> Marine Expeditionary Unit highlighted the critical issue of airspace control at an austere or forward airhead. Multiple aircraft scheduling activities created conflicts that often left vulnerable aircraft orbiting above the airhead. Additionally, the volume of traffic that schedulers allowed to arrive and depart the airfield did not allow ample time for engineers to maintain the field, creating 1) unsafe conditions, and 2) the potential for extended closure to perform significant repair once the landing surfaces went beyond acceptable conditions. The designation of a single airfield manager eliminated conflicts by making one person responsible for coordinating arrivals, departures, and airfield maintenance. (NLL, 2002:#LLCC0-02623)

The author of “Landing Support Operations” observed that inadequate numbers of landing support or aerial port specialists at airheads has an adverse affect on the throughput capability of the base. Specifically, insufficient numbers of trained landing support personnel impacts the marshalling and efficient on/off-loading of aircraft. Additionally, insufficient numbers of trained aerial port specialists may lead to in-transit visibility degradation because arriving and departing cargo may not be correctly recorded. The author recommends moving

landing support capabilities forward in the deployment sequence to provide the needed support to enhance throughput earlier in the process. (NLL, 2002:#LLCC0-02646) “Proportional Logistical Buildup” echoes the idea of needing to bring support forces early, adding that there were a few but in no way were the numbers proportional to the demand. Significant shortfalls in cargo handling personnel and equipment, camp management, and line-haul transportation exposed forces to unnecessary operational risk and the mission to failure. (NLL, 2002:#LLCC0-02647)

***Center for Army Lessons Learned.***

The Center for Army Lessons Learned (CALL) similarly collects and maintains a database of training and operational lessons learned. It was, in fact, a CALL briefing that sparked AMC/CE’s interest in pursuing doctrinal support of an AOS definition and assignment process. As requested by the Commanding General, U.S. Army Central Command (ARCENT), a combined arms assessment team was dispatched to conduct “direct collection of operational and strategic level lessons in the Coalition Forces Land Component Command (CFLCC) area of responsibility” (CALL, 2002:vii) for OPERATION Enduring Freedom. The scope of their findings was expanded by an opportunity to visit tactical level units across a broader spectrum of activities, including some in the area of BOS and AOS.

In the area of engineer operations, the Army learned valuable lessons from their work beside Air Force and British counterparts at Bagram airfield. Among these lessons learned were that “Army engineers operating in areas dependent on air [lines of communication] LOCs need to be highly trained and properly

equipped to perform rapid runway repair techniques” (CALL, 2002:94). Among recommended actions to rectify disclosed limitations were measures to incorporate Air Force RED HORSE and British equivalents’ rapid runway repair (RRR) techniques into Army doctrine and training (CALL, 2002:94). Another recommendation was to purchase and field select construction equipment with Army engineer units having RRR missions (CALL, 2002: 94). At Bagram, the Army actually purchased some of the suggested equipment from a redeploying Air Force engineer unit, so the Army could continue the mission (CALL, 2002:92-93).

A second major area of concern was base camp infrastructure development and command and control. Bagram’s rapid expansion presented significant challenges to the Army engineers and leadership, most notably in the areas of “providing latrine facilities, bed-down facilities, potable water, shower facilities, and adequate power distribution” (CALL, 2002:96). In addition, Army leadership at Bagram had difficulty developing a “base camp command and control organization in the midst of rapid expansion” (CALL, 2002:96). Given an unpredicted rapidly increasing camp population, the base leadership found themselves unable to adequately plan as the base expanded. Most units arrived without organic life-support equipment such as tents and shower/shave facilities, expecting the base camp to provide for these basic needs. As the population increased, the original power requirements planning factors were outstripped. Support requirements increased faster than the base leadership was able to satisfy them. (CALL, 2002:96-101) The lessons learned here clearly point to the



need to ensure field level commanders responsible for support activities have accurate and timely planning information, as well as an ability to act quickly, so they can provide an acceptable level of support.

The combined arms assessment team also reported on logistics, specifically the expected level of logistical support. The team reported that neither the Army nor the Joint community could reach agreement on standards for supply stock levels or what agency would be responsible for ensuring these stock levels were supported (CALL, 2002:133). Additionally, “there was poor policy on what was adequate base operation support and what common item support meant” (CALL, 2002:133). Essentially, the combined arms team discovered that the lack of a common vocabulary and standards of performance created significant enough bureaucracy to jeopardize the success of the mission.

### ***Task Force Enduring Look***

The Air Force clearinghouse for lessons learned from OPERATION Enduring Freedom (OEF) is Task Force Enduring Look (TFEL). The Chief of Staff of the Air Force directed the establishment of Task Force Enduring Look to actively collect, thoroughly analyze, and provide interim and progressive reports of Air Force, joint, and coalition operations during OEF. One of the charters of TFEL is to provide real time feedback to the field so that lessons learned can be implemented in current operations (TFEL Terms, 2002:1). This feedback is published in the Quick Look format; a concise document dedicated to a specific area of concern. Another TFEL product is the Interim Report. The Interim Report format provides a more comprehensive review, reporting information

across the spectrum of operations with applicable correlation and recommendations for improvement. The recommendations coming out of TFEL are not relegated solely to the Air Force, and therefore have implications for all the services. Several of the unclassified recommendations are provided here.

Quick Look #2, Combat Support and Expeditionary Basing, provided several recommendations in the realm of BOS and AOS. The classified report concludes with the recommendations that the Air Force “(U) Work with the Joint community to establish multi-service unity of command for combat support planning and deployment to austere bases by establishing a single command authority over BOS” and “(U) Develop a common Joint definition for base operating support” (TFEL Quick Look #2, 2002:5).

Interim Report 2 takes an in-depth look at operations throughout Afghanistan between 7 October 2001 and 14 January 2002. A repeated issue was the lack of a single authority responsible for a given location.

The absence of a single command authority at forward operating locations was a significant problem....Vague command arrangements initially raised questions as to who was in charge and who had responsibilities for force protection, safety, and base operating support (BOS) (TFEL Interim Report 2, 2002:5-52).

The break down in unity of command at the individual bases caused conflicts over scarce resources and in general impacted operational capability and cohesion. Units operating under different commands at joint sites often duplicated effort or sent situation reports addressing critical support issues to their respective command headquarters who were not in a position to work solutions.

In the future, pre-arranged responsibilities for BOS should be negotiated to reduce both duplication of effort and lack of equipment. The first step in accomplishing this arrangement is the standardization of definitions in BOS among the joint and coalition communities (TFEL Interim Report 2, 2002:15-22).

Lessons learned provide candid feedback from observers and participants in operations and exercises that point out problem areas affecting the efficiency and effectiveness of the military. The lessons learned discussed in this section indicate that significant issues exist in the realm of base and airfield support activities and planning. Until there is a common vocabulary among the services and joint staff, support activities may be hampered by an inability to communicate requirements and issues. Additionally, a common vocabulary will facilitate a better understanding of standards of performance, eliminating some of the disparity between the services.

### **III. Organizational Structures**

#### **Overview**

This chapter is divided into two primary sections: home station and expeditionary organizational structures. Each of these areas are further divided into two subsections: one Air Force and one Army. The reason for reviewing each service in both environments is to gain a basic understanding of how these two services respectively provide support to the operational mission.

The Navy and Marine Corps organizational structures were not included in this research effort. The Marine Corps was excluded because they are organized as a self-sustaining, combined arms force, limited in size and thus capability to support non-organic forces, i.e., those from other services. The primary Marine Corps support organization, the Force Service Support Group, is "...a permanently organized command charged with the responsibility of providing all major CSS [combat service support] functions for the MEF [Marine Expeditionary Force] ...." and "is staffed and equipped [...] to support a one division/one wing MEF...." (MCRP 5-12D, 1998:5-1) The Navy was omitted from this research effort due to their focus on maritime operations, resulting in a preponderance of their resources being limited to off-shore and/or near-shore operations. This is not to say the Navy does not have significant support capability. The Naval Construction Force, commonly referred to as the SEABEES (JP 4-04, 2001:V-2), and the Navy's contributions to Joint Logistics

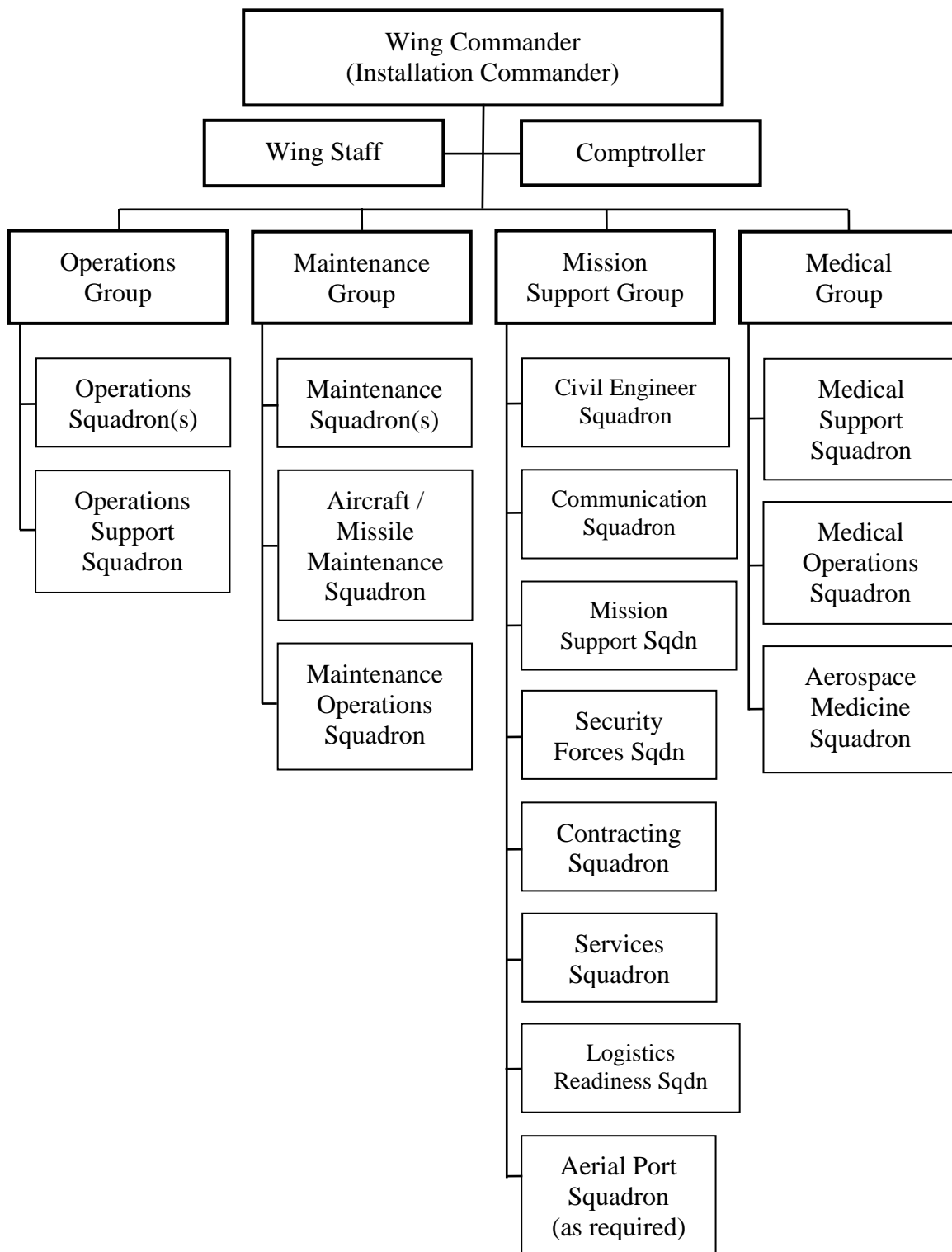
Over the Shore (JP 4-01.6, 1998:II-4), are two prime examples of Navy support to joint operations. Navy and Marine Corps resources, such as the Navy Lessons Learned database, were utilized to gain a broader research base.

## **Home Station Installation Organizational Structure**

### ***The Air Force Wing***

AFI 38-101 (1998), Air Force Organization, “describes the objectives and principles of Air Force organization. It prescribes various levels and standard structures for organizations...” (1). AFI 38-101 (1998) is currently under revision to incorporate changes prescribed by Program Action Directive (PAD) 02-05, Headquarters Air Force Implementation of the Chief of Staff of the Air Force Direction to Establish a New Combat Wing Organization Structure (2002). The revised AFI 38-101 is not due to be published before June 2003. The new combat wing organization alters the basic internal organization of an Air Force wing from the one detailed in the current AFI 38-101 (1998). This research effort used the organization charts and information concerning new or altered organizations from PAD 02-05 (2002) in conjunction with AFI 38-101 (1998) for any unchanged organizations and general descriptions of organizations to describe the basic components of an Air Force wing and how those organizations contribute to base or airfield operating support.

The standard combat wing organization structure, shown in Figure 1, calls for the wing commander to be supported by a wing staff, a comptroller function, and four groups. Two of the groups, operations and maintenance, are operationally



**Figure 1. New Combat Wing Organization Chart (PAD 02-05, 2002, A-I-1)**

related, meaning they are generally associated with a flying operation. The other two groups, mission support and medical, are designed to provide support services to enable and enhance mission effectiveness and accomplishment. The standard wing staff is composed of public affairs, safety, history, staff judge advocate, command post, chaplain, manpower and quality, plans, social actions, and inspector general (AFI 38-101, 1998:13-15). The comptroller function reports to the wing commander, as well, but generally is organized outside the wing staff because this activity is responsible for funds management for all wing activities and organizations, including the wing staff. PAD 02-05 moves the plans function off the wing staff and combines it with the transportation and supply activities, forming the logistics readiness squadron (PAD 02-05, 2002:3).

### ***The Army Installation Management Team***

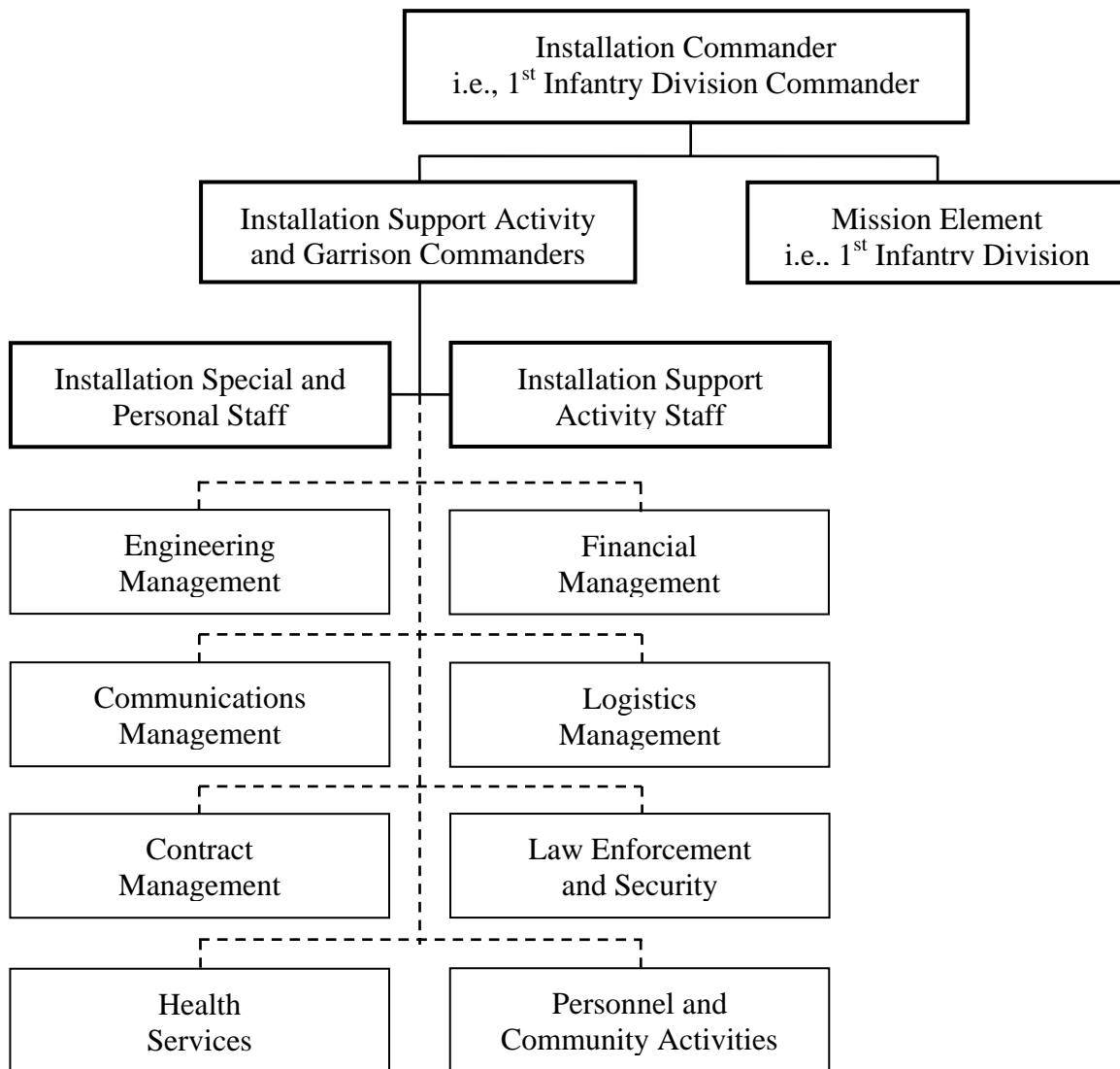
Field Manual (FM) 100-22, Installation Management “provides the processes for the core installation functions” which allow all Army installations to operate as training, deployment, sustainment, and reconstitution platforms (FM 100-22, 1994:vii). The construct of the Army installation organization below the installation commander level appears to vary based on location, installation mission, and major command (MACOM) of assignment. A basic tenet of Army installation management seems to be that the installation commander generally is the most senior commander on the installation. Because a division or corps commander, dual-hatted as the installation commander, usually deploys with the forces, garrison and installation support activity commanders are assigned responsibility for day-to-day base operations at continental United States

(CONUS) and territorial bases. As a group, the installation, garrison and installation support activity commanders represent the installation command element. (FM 100-22, 1994:2-1, 2-2) The installation commander is responsible for all activities on the installation and represents unity of command. The subordinate garrison and support activity commanders, however, provide for the day-to-day operations, as well as the continuity of operations when the installation commander deploys with the force (FM 100-22, 1994:2-1).

FM 100-22 describes the functional groupings of installation organizations as being three segments: the mission element, nonsupporting tenants, and supporting tenants (FM 100-22, 1994:2-2, 2-3). The mission element is the reason the installation exists; an infantry division headquarters and a training center are two examples. Nonsupporting tenants are those units that do not contribute directly to the primary mission or support activities of the installation. A non-deploying staff agency headquarters is an example of a nonsupporting tenant. The supporting tenants are those of interest to this research effort. Supporting tenants are “a comparable standard group” of organizations “assigned to MACOMs other than the installation’s MACOM...to provide a particular service” (FM 100-22, 1994:2-3). Further, directors and commanders of these supporting tenants are considered “part of the installation management team...to provide quality goods and services to the entire community” (FM 100-22, 1994:2-3).



To span the differences between installation missions and focus, the Army developed a flexible organizational template, shown in Figure 2. This template starts with the installation special and personal staff, which can be tailored for



**Figure 2. Army Installation Management Organization (FM 100-22, 1994)**

various missions and activities. Members of this staff element include: the inspector general, the staff judge advocate, internal review and audit compliance, historian, public affairs, installation safety office, and the installation chaplain. (FM 100-22, 1994:2-5, 2-6, 16-4) These activities are very similar to the Air

Force wing staff and provide the commander the counsel, liaison, and evaluations to maximize mission effectiveness and efficiency. The command element is also supported by an installation support activity staff comprised of a directorate of plans, training, and mobilization; as well as, a directorate of counter intelligence and security (FM 100-22, 1994:2-7). Together, the special and personal staff and the installation support activity staff represent the only activities reporting directly to the garrison commander.

The other functions or activities assigned to support the base are provided by functional MACOMs, such as US Army Health Services Command and the US Army Corps of Engineers. While these organizations are assigned to support the base and are part of the installation management team, the garrison commander does not exercise command over these tenant forces, depicted by the dashed lines.

## **Expeditionary Organizational Structure**

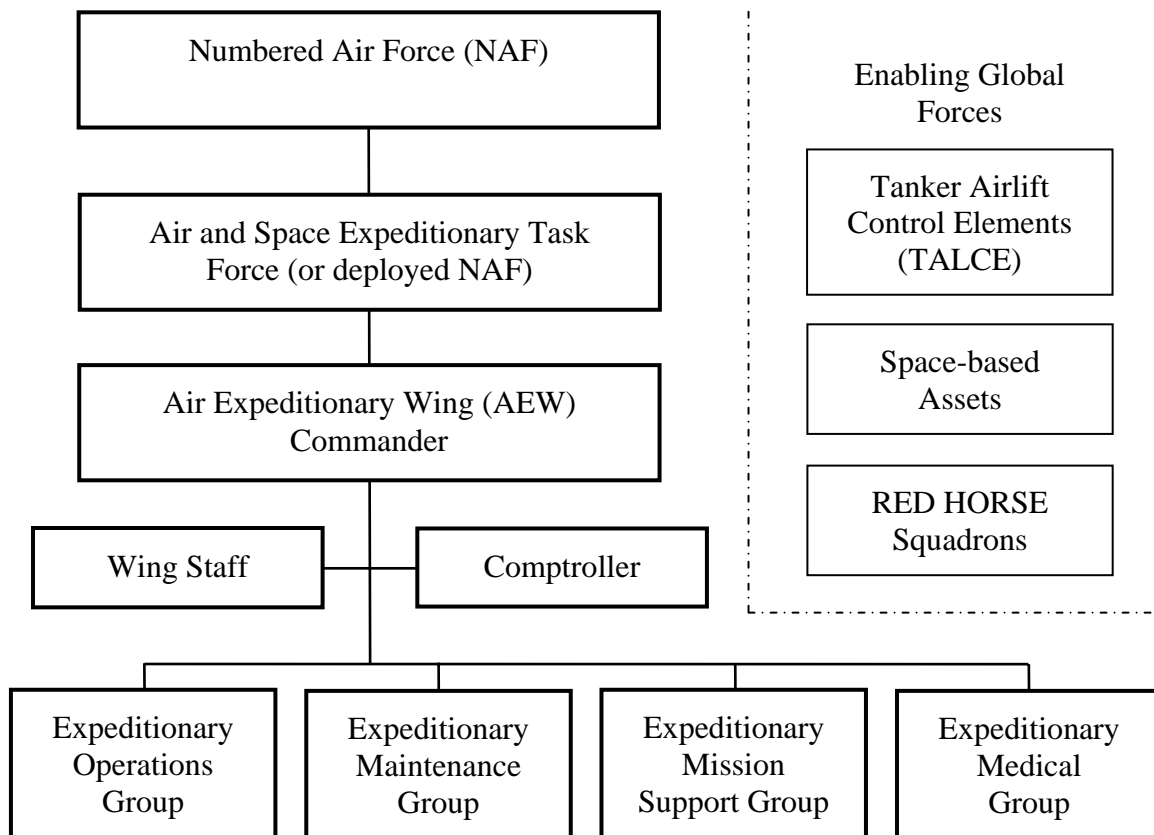
### ***The Air Force Air Expeditionary Forces***

The Air Force, while having a general need to operate from fixed power projection platforms, is an expeditionary force. Air Force units have deployable elements within their normal home station structure that can be sent forward into an area of operations. Whether at home station or forward deployed, “the numbered air force (NAF) is the senior warfighting echelon of the Air Force” (JP 3-33, 1999:II-10). An air and space expeditionary task force (ASETF) is the element directly subordinate to a NAF headquarters, providing command and

control of assigned Air Force forces in a joint operation (JP 3-33, 1999:II-10-11).

When called upon to provide forces, the Air Force does so through the Air Expeditionary Force (AEF), “an organizational structure composed of force packages of capabilities that provides warfighting [combatant commanders] with rapid and responsive aerospace power” (AFDD 2, 2000:38).

While an AEF is not a deployable unit, it is composed of deployable elements that are assigned to the ASETF. The largest of these is the Aerospace Expeditionary Wing (AEW), which will be the focus of this research effort’s review. Figure 3 depicts a notional AEW construct which looks very similar to the



**Figure 3. Structure of a Notional Aerospace Expeditionary Wing (AFDD 2, 2002; JP 3-33, 1999)**

wing organization described previously under the home station section. Just like the standard combat wing, the AEW “normally is composed of the wing command element and several groups” (AFDD 2, 2000:38). These groups are designated as expeditionary groups, and expeditionary squadrons, similar to those depicted in the new combat wing at Figure 1, are assigned to the expeditionary groups.

Additional Air Force elements may also be assigned to facilitate operations, but may not be assigned to the ASETF, and thus fall outside the bounds of the AEW. One example is the tanker airlift control element (TALCE). TALCEs provide command and control of inter- and intratheater airlift and tanker missions at austere or expeditionary operating locations (JP 1-02, 2003:522). Because of the advantages of centralized control of these global functional forces, TALCEs remain operationally controlled by USTRANSCOM through AMC, and thus do not fall under the auspices of the ASETF or AEW (AFDD 2, 2000:46,68). Similar exceptions exist for other global functional forces, such as space-based assets (AFDD 2, 2000: 46).

### ***The Army in the Field***

The Army is designed as a flexible, echeloned force in which “each sequentially larger organization...possesses greater capability for both sustained and independent operations” (JP 3-33, 1999:II-2). The warfighting force is modular and deploys in tailored packages. The combat forces are married with appropriate combat support (CS) and combat service support (CSS) forces to meet mission requirements, as shown in Figure 4. CS forces provide critical and

direct support with and to combat forces and include military police, military intelligence, signal corps, most engineer capabilities, chemical corps, and civil affairs (JP 3-33, 1999:II-3). CSS forces complete the warfighting Army by providing essential sustainment tasks. CSS forces include elements of the “medical department, transportation corps, judge advocate general corps, acquisition corps, ordnance corps, finance corps, adjutant general corps, chaplain corps, and some types of engineer and aviation units” (JP 3-33, 1999:II-3).

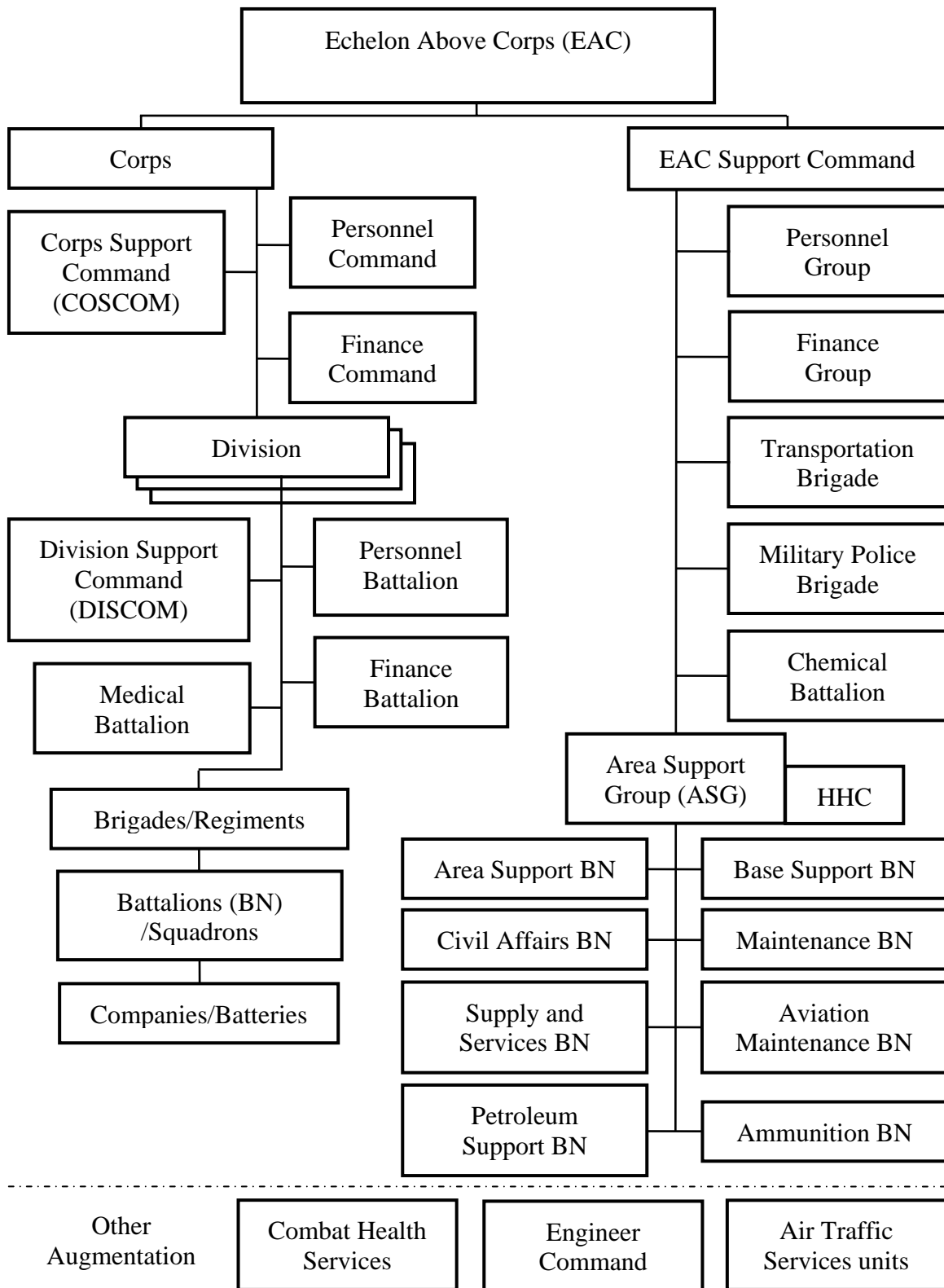
When the Army deploys to the field, it is the Army corps that represents the “level of command required to synchronize and sustain combat operations” (JP 3-33, 1999:II-4). A corps generally comprises 35,000 to 125,000 troops and normally is commanded by a lieutenant general (JP 3-33, 1999:II-4). Each Army corps is assigned a corps support command (COSCOM) which provides required logistics support to maintain and sustain the corps (FM 63-3, 1993:1-10). The types of logistic missions a COSCOM performs include: direct and general supply of subsistence, repair parts, water, ammunition, and construction materiel; field services such as mortuary affairs, field laundry, and clothing repair; equipment, vehicle, and aviation maintenance; transportation services such as terminal operations and cargo transfer; and medical, dental, and veterinarian services (FM 63-3, 1993:1-10 – 1-11).

The Army division is the echelon below the corps. Divisions consist of three brigades; all three of which are either infantry, mechanized infantry, or armor depending on the mission of the division. Additionally, part of the division's 8,000

to 16,000 soldiers are comprised of “organic artillery, air defense, aviation, communications, engineers, intelligence,...and logistics units” (JP 3-33, 1999:II-4). Like the corps that deploys with its COSCOM, the division deploys with its division support command (DISCOM). The DISCOM provides or operates complete supply support for the first nine classes of supply; ammunition transfer points; common item, missile materiel, and aviation materiel maintenance; materiel management; transportation of materiel and personnel; salvage; and health service support including emergency care, advanced trauma, emergency dental, ground evacuation, and medical maintenance. Despite substantial organic support, the DISCOM is largely dependent on the COSCOM to provide supply distribution forward into the DISCOM's area of operations; field services; financial and personnel services; and aeromedical evacuation support. (FM 63-2, 1991:1-1 – 1-2)

Echelons below the division include brigades, battalions, and company-sized units. These units are functionally organized and equipped to provide specific capabilities in the same manner as Air Force squadrons, and represent the building blocks for Army force presentation to the warfighter (JP 3-33, 1999:II-4).

The descriptions of Army organization thus far focused on operational or combat forces and their specific support organizations. It is important to understand that each echelon of the Army's combat forces have some organic support capability due to the expeditionary nature of Army units. Given the size of these units and the land area across which they might be spread, it is critical to their sustainment that support be married with combat force.



**Figure 4. Army Support Organization in the Field (JP 3-33, 1999; FM 1-120, 1995; FM 54-40, 1995; FM 63-2, 1991; FM 63-3, 1993; FM 100-10, 1995)**

Organic support, however, is not the extent of the Army's support force structure. The Army also has other support elements that operate along side and across the areas of operation of the corps and corps subordinate echelons. As shown in Figure 4, area support groups (ASGs) are tailored combat service support organizations, subordinate to the echelon above corps support headquarters (FM 100-10, 1995:3-7). ASGs provide area command and control for supply, fuels, field service support, and maintenance. Additional missions assigned by the support headquarters may include real property maintenance and nuclear, biological, and chemical warning and reporting (FM100-10, 1995:3-7). When COSCOM or DISCOM capabilities are exceeded, an ASG may provide augmentation support. ASGs also "may tailor a slice of support to set up a forward support base or provide support at an intermediate staging area" (FM 54-40, 1995:1-1). ASG elements facilitate reception, staging and onward movement of forces by operating adjacent to aerial ports of debarkation and coordinating activities with the Army arrival control group. In addition to the care and feeding of arriving forces, the ASG may provide life support services to the port support forces. (FM 54-40, 1995:1-9 -1-10)

When the Army elects to establish fixed locations from which to sustain ongoing operations, it "uses the ASG to manage installations" (FM 54-40, 1995:2-6). "Base operations activities and other installation support functions are accomplished by augmenting the ASG" to meet the responsibilities described in FM 100-22, the field manual for installation management (FM 54-40, 1995:2-6). Augmentation may include specialties such as utility teams to provide general



engineering and real property maintenance, as well as fire-fighting teams, sized for force strength, aviation, and facility requirements (FM 54-40, 1995:2-6).

Although an ASG is a tailored organization, taking shape based on assigned missions, there is a basic structure common to all ASGs. An ASG has a command and control element known as the headquarters and headquarters company (HHC). The ASG HHC comprises a command section; a personnel directorate; a security plans and operations directorate; a support operations directorate; a staff judge advocate section; a unit ministry team; and headquarters company. The security, plans and operations directorate handles operational analysis and planning; intelligence assessments; engineer requirements and real property maintenance management; communications; and security coordination (FM 54-40, 1995:3-1 – 3-10). The support operations directorate “manages internal and external logistics support” (FM 54-40, 1995:3-10) through its supply and services, transportation, and maintenance branches. In total, the ASG HHC provides the ASG commander similar council and management capabilities as the installation support activity and installation special and personal staffs provide the Army’s home station garrison and installation support activity commanders discussed previously.

Subordinate to the ASG are a variety of support units, developed and attached as required to fulfill mission requirements. These units include the area support battalion, the base support battalion, the rear operations center, the supply and service battalion, the petroleum supply battalion, the maintenance battalion, and the aviation maintenance battalion. Of greatest significance to

base operating support is the base support battalion (BSB). One BSB is attached to the ASG for each installation under the ASG's jurisdiction, and may be tasked with establishing base operations support including locations "previously inoperable or under non-US control" (FM 54-40, 1995:2-15). BSBs operate the following fixed assets: dining facilities, maintenance shops, storage bunkers, warehousing facilities, fuel facilities, terminal facilities, railway points, and fixed laundry (FM 54-40, 1995:2-15). A BSB conducts all operations in accordance with FM 100-22, Installation Management (FM 54-40, 1995:2-15). The organizational structure of the BSB generally includes the following: a command and control element known as the headquarters and headquarters detachment which is a smaller echelon of the HHC; the provost marshal and a military police unit; a directorate of logistics; a department of public works and facilities maintenance; and civil affairs teams providing an interface with the local population to include the facilitation of contract services and support (FM 54-40, 1995: 2-17). Together, these organizations allow the BSB to plan and execute reception, staging, forward movement, and sustainment of combat forces.

The aviation maintenance battalion attached to the ASG may be the most important element of the ASG concerning its ability to perform portions of the airfield operating support mission. Aviation maintenance battalions are attached to an ASG based on aircraft density (FM 54-40, 1995:6-5). The aviation maintenance battalion headquarters element provides command and control of operations, as well as aviation safety and standardization and evaluation supervision. The repair activities performed by the aviation maintenance

battalion include intermediate level maintenance on Army aircraft, armament, and avionics (FM 54-40, 1995:6-5).

There is another group of units that cross organizational boundaries similarly to area support groups; Army air traffic service (ATS) units. “Air traffic service units promote safe, flexible, and efficient use of airspace” (FM 1-120, 1995:3-1) across the spectrum of deep, close and rear area operations. ATS unit capabilities include: enemy aircraft approach warnings, standby and pilot-activated navigational aids; navigation assistance; flight following; distribution of airspace weather information; air traffic control tower services similar to those at home station airfields; the establishment of non-precision approaches; and the provision of passive and active approach guidance (FM 1-120, 1995:3-6 – 3-8). The Army’s ATS units are organized, trained, and equipped to manage and control airspace in forward areas, as well as at expeditionary airfields. The tactical aviation control teams have some of the same command and control capabilities as tanker airlift control elements or special tactics teams of the Air Force.

Although this review focused on the ASG, it is not the only organization subordinate to the echelon above corps support command. Tailored commands in the areas of personnel, finance, transportation, military police, and chemical provide coordination and support to other functionally aligned units through the area of operations.

## **IV. Support Models**

### **Overview**

The organizational structures presented and discussed in Chapter III provide the basis from which to develop models of base and airfield operating support for both the Air Force and Army. The organizational structures were broken down to discern the types of activities, the capabilities, and the services each provides. Depending on the applicability, the activities were grouped as either base or airfield support.

### **Air Force Base Operating Support**

Table 1 was developed from the combat wing organization structure in PAD 02-05 (2002) and applicable subordinate activity definitions in AFI 38-101 (1998). The mission support group and medical groups, as well as the wing staff and agencies, provide the bulk of the Air Force's BOS. These units, under the command and control of a single command element ensure the products and services required to sustain a force are available. Without these elements, routine as well as combat operations would not sustainable.

Comparison of the home station and expeditionary organizational structures for the Air Force reveals no significant differences below the wing level. This probably is due in large part to the nature of Air Force operations and the requirement for a relatively fixed platform, a runway, from which to operate. Whether at home station or in the expeditionary environment, the same basic requirements exist to sustain the force. The Air Force wing is designed to operate in either environment.

**Table 1. Air Force Base Operating Support**

WING COMMANDER	SECURITY SERVICES Law Enforcement and Force Protection
WING STAFF Public Affairs Safety History Staff Judge Advocate Command Post Chaplain Manpower And Quality Social Actions Inspector General	FIELD SERVICES Subsistence Laundry Mortuary Affairs Morale, Welfare, Recreation
FINANCE/COMPTROLLER	CONTRACTING SERVICES
ENGINEERING General Explosive Ordnance Disposal Nuclear, Biological, Chemical, Fire Protection Services	LOGISTICS READINESS Transportation Services Vehicle Operations Vehicle Maintenance Internal Distribution Shipping and Receiving Supply Services Ordering and Storage Fuel Logistics Plans
COMMUNICATIONS Voice, Data; Non-/Secure; Computer Support; NIPR-/SIPRNet Official and Personal Mail	HEALTH SERVICES Medical Operations Bioenvironmental/Public Health Mental Health Dental Services
PERSONNEL SERVICES	

### **Army Base Operating Support**

A depiction of the Army's base operating support activities can be extrapolated by comparing and combining the installation management and area support group organization structures shown in Chapter III. An examination of several of the supporting tenants' activities reveals significant detail of the scope and breadth of the Army's base operating support. For instance, under logistics management, the directorate of logistics (DOL) controls the installation transportation office, the installation supply activity, and the installation maintenance activity. Subsequently, the installation supply activity is responsible for the storage and distribution of munitions, fuels, and materiel; food services;

clothing exchange and individual equipment; laundry services; and mortuary affairs. (FM 100-22, 1994: 11-1 - 11-6) Table 2 provides a summary of the activities involved in the Army's base operating support.

**Table 2. Army Base Operating Support**

COMMANDER ELEMENT	CONTRACT MANAGEMENT
COMMAND OR HEADQUARTERS	LOGISTICS MANAGEMENT
STAFF ACTIVITIES	Transportation
Inspector General	Motor Pool
Staff Judge Advocate	Passenger Movement
Internal Review and Audit	Shipping and Receiving
Compliance	Supply and Field Services
Command Historian	Munitions
Public Affairs Office / Civil Affairs	Fuel
Safety Office	Clothing and Individual Equipment
Chaplain	Food Services
Provost Marshal	Mortuary Affairs
	Maintenance Activity
PLANNING STAFF	Vehicles
Plans, Training, and Mobilization	Communication Equipment
Counterintelligence	Small Arms
Security	
PERSONNEL AND COMMUNITY	INFORMATION MANAGEMENT
ACTIVITIES	Telecommunications
Personnel Management	Records and Publications
Morale, Welfare, Recreation	Visual Information
Community Support	
ENGINEERING MANAGEMENT	HEALTH SERVICES
Construction, Repair, Maintenance	Medical Treatment
Fire and Emergency Services	Preventive Health
Environmental	Industrial Health
	Veterinarian
	Dental
FINANCIAL MANAGEMENT	LAW ENFORCEMENT AND SECURITY
Budget	Physical Security
Accounting	Criminal Investigations
Manpower Management	Prisoner / Prisoner of War Management
	Magistrate's Court

Similar to the Air Force BOS model, the Army BOS model finds significant support activities within the command element's staff. Legal, financial,

compliance, safety, and public affairs are critical elements of sustainment and provide valuable services to the supported community. Whether these support activities are found in the garrison or installation support activity commanders' staffs or the headquarters and headquarters company of the area support group, the existence of these activities is recognition of their importance to operations.

### **Air Force Airfield Operating Support**

The Air Force organizational structures discussed in Chapter III contain activities associated with the operational or flying mission. Specifically, the activities within the operations and maintenance groups, as well as those of the aerial port squadron where applicable, enable and enhance the flying mission success. The focus of the operations group is the planning and execution of air and space power, supported by the maintenance group's focus on maintaining air and space weapons systems (PAD 02-05, 2002: i). The aerial port squadron is required to facilitate the handling and management of passengers and cargo associated with air mobility airlift operations. At non-AMC installations, part of the home station organizational structure might include a tenant air mobility squadron (AMS). An AMS operates the air terminal facility to include cargo and passenger handling, tanker and airlift aircraft maintenance, and elements of aircraft command and control (JP 3-17, 2002:VI-4). In an expeditionary environment, tanker airlift control elements (TALCEs) and their augmenting

mission support teams and mission support elements fulfill the role of the aerial ports and AMSs (JP 3-17, 2002:VI-4).

Table 3, Air Force Airfield Operating Support, was developed using the PAD 02-05 (2002), and augmented with additional activity definitions from AFI 38-101 (1998) and JP 3-17 (2002).

**Table 3. Air Force Airfield Operating Support**

<b>MAINTENANCE</b>	<b>OPERATIONS SUPPORT</b>
Aircraft Maintenance and Servicing	Airfield Management
Maintenance Scheduling	Air Traffic Control Services
Munitions Maintenance	Flying Scheduling
Maintenance Quality Assurance	Life Support
Aerospace Ground Equipment	Flight Records
	Operational Intelligence Services
<b>AERIAL PORT</b>	Weapons and Tactics
Cargo Handling	Weather
Passenger Handling	
Materiel Handling Equipment (463L)	

### **Army Airfield Operating Support**

The Army has significant air assets, largely in the form of rotary wing aircraft or helicopters. While rotary and fixed wing aircraft requirements may vary, they do share some basic support tenants. Aircraft operations decidedly are different from ground operations and thus demand additional and specialized oversight, planning, and maintenance.

Field Manuals 1-100, Army Aviation Operations (1997) and 100-16, Army Operational Support (1995) discuss at length the organization and capabilities of Army aviation maintenance. Much of the maintenance capability is organic to the aviation units or attached to the appropriate level support command, corps,



division or area (FM 1-100, 1997:A-1 – A-18;FM 100-16, 1995:4-15). Aviation maintenance in the Army is organized in a three tier system: unit, intermediate, and depot (FM 100-16, 1995:4-14). Unit and intermediate aviation maintenance units are tailored to support specific aircraft types and densities and do not transfer easily to other weapon systems without personnel and equipment changes (FM 100-16, 1995: 4-15).

Additional airfield services are provided by Army air traffic services (ATS) units, as previously discussed. These units provide Army airspace command and control and air traffic control (FM 1-100, 1997:2-9). Airspace command and control involves the coordination, integration, and regulated use of designated airspace including the differentiation between friendly and enemy aircraft (FM 1-100, 1997:2-9). Air traffic control units are manned and equipped to provide fixed and expeditionary air traffic services that include: airspace deconfliction, navigation assistance, flight following, airfield terminal control, and precision/nonprecision instrument approaches (FM 1-100, 1997:2-9).

The Army also has considerable capability to perform terminal operations such as cargo handling once aircraft have arrived at the aerial port. Transportation cargo transfer companies operate at locations where cargo changes transportation carrier or mode. The capabilities of transfer companies include “unloading, segregating, repairing, temporary holding, documenting, and cargo loading,” as well as small break bulk consolidation points (JP 4-01.5, 2002:B-A-3).

The mobility forces operating an aerial port generally will be augmented by an arrival/departure airfield control group (A/DACG). A/DACGs are non-service specific, tailored, provisional organizations assembled from forces not accompanying the transported force. A/DACGs provide assistance to aerial port operators in the areas of processing, loading, and off-loading personnel and equipment. Additionally, A/DACGs liaise between the aerial port forces and the transported force to facilitate rapid movement and efficient operations.

(JP 4-01.5, 2002:III-5 – III-6) While A/DACGs are not limited to the Army, when an Army unit deploys they generally will be tasked and will provide an A/DACG to interface with the supporting mobility forces.

Table 4 depicts an extrapolation of Army airfield operating support as interpreted from JP 4-01.5 (2002), FM 1-120 (1995), and FM 100-16 (1995). Just

**Table 4. Army Airfield Operating Support**

<b>MAINTENANCE</b>	<b>OPERATIONS SUPPORT</b>
Aircraft Maintenance and Servicing	Flying Scheduling
Maintenance Scheduling	Operational Intelligence Services
Munitions Maintenance	Command Post
Maintenance Quality Assurance	Air Traffic Control Services
	Navigation Aids
<b>AERIAL PORT</b>	Flight Following
Cargo Handling	Approach Instrumentation
Passenger Handling	
Movement Control	

as with the two BOS models, great similarity is found between the Army and Air Force models for AOS. The three primary elements of maintenance, operations support and aerial port are found to comprise virtually the same roles. Where the

tasks do not match exactly, they are complimentary to the other service's tasks. One example of this is the case of A/DACGs and transfer companies complimenting the mobility forces at an aerial port.

### **Base and Airfield Operating Support**

Table 5 shows how a synthesis of the four models presented thus far can be compiled. This model also shows how BOS and AOS activities interrelate. There is some clear distinction between the activities associated with base and airfield support. Those activities in the left column are required to maintain a base and sustain a force at that base. Specific activities required to facilitate airfield operations are at the top of the right column in Table 5. These activities are required only at operational airfields. BOS and AOS overlap at those activities shown with an arrow from the AOS column to a corresponding BOS activity. The AOS activities listed adjacent an arrow are those activities that are required to augment already required or in-place BOS activities in order to facilitate or enable airfield operations. For instance, the fuel storage and distribution authority for BOS already provides management of motor gasoline and diesel fuels. The additional requirement to manage aviation gasoline represents a nominal increase in work load, and it makes sense for the same activity to be responsible for all fuels management. The AOS activities that augment existing BOS activities can be accomplished by a means other than the BOS provider; but for the sake of unity of effort and economy of force, it is

recommended that the augmenting force work within the established support construct instead of establishing a completely new organization.

**Table 5. Base and Airfield Operating Support**

<u>BASE OPERATING SUPPORT (BOS)</u>	<u>AIRFIELD OPERATING SUPPORT (AOS)</u>
<b>COMMAND ELEMENT</b> Command Post Planning, Training, Compliance	<b>AIRCRAFT SERVICING</b> Refueling Operations Maintenance Life Support
<b>PUBLIC / CIVIL AFFAIRS</b>	
<b>LEGAL</b>	<b>AIRFIELD MANAGEMENT</b> Airport Manager/Base Operations Air Traffic Control Navigation Aids/Approach Control Aircraft Marshaling Aircraft Command and Control
<b>FINANCE/COMPTROLLER</b>	
<b>CONTRACTING</b>	
<b>CHAPLAIN</b>	<b>AERIAL PORT/AIR TERMINAL OPERATIONS</b> Materiel Handling Equipment (463L) Cargo Handling Passenger Handling
<b>COMMUNICATIONS AND INFORMATION</b> Telephone; radio; non-/secure; voice/data Computer support; NIPR-/SIPRNet Official and Personal Mail	
<b>LOGISTICS SERVICES</b> ← Supply Services Transportation Services Maintenance Services	Air Munitions Maintenance Aerospace Ground Equipment
<b>FUEL</b> ← Motor Gasoline and Diesel	Aviation Gasoline
<b>FIELD SERVICES</b> Subsistence Laundry and Shower/Shave Mortuary Affairs Morale, Welfare, Recreation	
<b>HEALTH SERVICES</b> ← Medical operations Public Health/Immunizations Mental Health	Aeromedical Evacuation Flight Surgeon
<b>INTELLIGENCE SERVICES</b> ← Local Threat/Force Protection	Operational/Power Projection
<b>SAFETY</b> ← Ground/Weapons (Ground)	Flight Weapons (Air)
<b>ENGINEERING</b> ← General (fabricate, repair, maintain)	Aircraft Barriers Airfield Lighting Rapid Runway Repair Airfield Sweepers
<b>PERSONNEL SERVICES</b>	
<b>EMERGENCY SERVICES</b> ← Disaster Preparedness Explosive Ordnance Disposal Structural Fire Response	Crash/Rescue Response
<b>WEATHER</b> ←	Upper Atmosphere and En Route or Global Forecasting
<b>SECURITY SERVICES</b>	

## **Alternative Methods of Accomplishing BOS and/or AOS**

### ***Military***

Navy or Marine units may have valuable assets available to offer to the joint force. These services do have units capable of providing specific support to sustain a larger force or to provide a particular service; some may have the ability to perform BOS or AOS.

The Navy's primary construction forces commonly referred to as the SEABEES maintain significant heavy vertical and horizontal construction capability. SEABEE units can "construct roads and bridging for supply routes, construct or extend airfield pavements, establish ammunition supply points, build expeditionary airfields and advanced bases, and erect all types of force beddown facilities" (JP 3-34, 2000:A-3). SEABEE units are organized and equipped to operate independently requiring only sustainment and Class IV supply support to remain effective (JP 3-34, 2000:A-3). SEABEE unit capabilities are a great asset to any joint force, and are perhaps most effective when operating with their maritime sister service, the Marine Corps. The SEABEES "have specialized capabilities for performing engineering work at the water and shore interface in support of amphibious operations" (JP 3-34, 2000:A-3). While the SEABEES represent a great asset, a majority of the Navy's resources to support base or airfield operations appear limited to near-shore operations. The ability to provide joint logistics over the shore and sustain shore installations is critical to operations in close proximity to the sea, but the Navy may be limited in its ability to deploy and sustain forces inland.

The Marine Corps, organized into Marine Air Ground Task Forces (MAGTFs), are uniquely suited to provide early command and control, as well as the core of a joint task force (JP 3-33, 2000:II-6). MAGTFs are self-sustaining based on their organic combat service support and are very attractive as providers of AOS because they have integrated air operations with the rest of their combined arms forces. The significance of this integration is that along with organic combat service support for ground combat forces, the Marine Corps must have also integrated air operations support. The limitation of MAGTFs, however, is that their logistics, intelligence, and communication links are at sea which ties the majority of marine forces to near shore operations. (JP 3-33, 2000:II-5).

### ***Coalition Forces***

In today's political environment, military operations around the world have involved an increasing number of coalition endeavors. One alternative to having a US military service provide BOS and/or AOS is to assign the task to one of the coalition members. Even if these nations do not have a robust enough military to provide all the activities required of BOS and/or AOS, they might lend assistance in a critically undermanned or over tasked area. One example of coalition forces providing an element of AOS already mentioned was the British engineer team that performed rapid runway repair at Bagram Airfield, Afghanistan. Another example would be the integration of Norwegian engineer and Bosnian explosive ordnance disposal (EOD) teams with US EOD teams at Bagram and Kandahar Airfields, Afghanistan. The Norwegian's mine flail and the Bosnian mine detection dogs worked under US EOD supervision to clear large areas around

the airfields for use as force beddown areas. The seamless blending of forces and complimenting equipment of the coalition forces greatly aided in successful operation. (CALL, 2002:x,106-116)

### ***Allied Forces***

Alliances, such as the North Atlantic Treaty Organization (NATO), afford the US military with long standing political and military relationships with some foreign nations. These military to military relationships provide the opportunity to share ideas, technologies, procedures, tactics, and techniques with each other. Currently, NATO is developing a capability for base opening, similar to the Air Forces concept behind the Global Mobility Task Force. According to Wing Commander Thomson, Royal Air Force, assigned to NATO's Reaction Force Air Staff (RFAS) Mobility, Airlift, Movements and Transportation branch, NATO is developing a Combined Airlift Control Element (CALCE) (Thomson, 2003). The NATO CALCE will provide a tailored package to provide airfield and/or base operating support, as the mission requires. The core package will always contain the command element and the air port operating group. This group comprises an aerial port function, an air traffic liaison officer, an aircraft maintenance function, and an operations support element.

Two additional groups may be deployed to supplement the air port operating group when conditions at the designated airfield warrant. These two groups are the logistics support group and the air port support group. The logistics support group comprises elements to support messing, billeting, personnel administration, contracting, medical, and supply elements. The air port support

group includes air traffic control, navigation aid, crash/rescue response, and engineer elements. (Thomson, 2003) The CALCE provides NATO a tailored force package to provide AOS and complimenting BOS when and where required (Thomson, 2003).

### ***Contract***

Each of the services has contingency contracts. The Army's logistics civilian augmentation program (LOGCAP), the Air Force contract augmentation program (AFCAP), and the Navy's construction capabilities contract (CONCAP) all provide the military with critical logistics support on an on-call basis (JP 4-0, 2000:V-2). These contracts provide services such as "building roads, airfields, dredging, stevedoring, transportation services, mortuary services, billeting and food services" (JP 4-0, 2000:V-2). JP 4-0, Doctrine for Logistic Support of Joint Operations, addresses contract support in Chapter V, Contractors in the Theater (JP 4-0, 2000:V-1-V-10).

Theater support contractors, or contractors local to the area of operations, are used extensively to support smaller operations and to augment specific requirements of the deployed force (JP 4-0, 2000:V-2). These contractors utilize their ties with pre-existing supply chains and vendor markets to provide a broad range of services from billeting and messing to translation, transportation, and construction (JP 4-0, 2000:V-2). During ENCAP-96, a Special Operations Command-Pacific joint task force (JTF) to the Kingdom of Cambodia, the JTF commander contracted laundry, base camp and work site messing, and a major earth moving contract through a local agent known as "Canadian Bob." My



knowledge of this operation comes from being the JTF Executive Officer (XO) and Senior Engineer. My responsibilities included day-to-day contact with Canadian Bob and the other contractors supporting the JTF. Canadian Bob knew and understood the intricacies and nuances of dealing with local vendors to ensure timely, cost-effective, and satisfactory work. When repair parts for the base camp water purification units could not be located by the JTF logistics officer, Canadian Bob was called. He sourced and delivered the required parts the following day from a store 120 kilometers away. Considering the infrastructure of Cambodia in 1996, this was an amazing feat. If the JTF commander had not contacted this theater support contractor, the JTF would have had to suspend showers and shaving, as well as resorted to bottled water for all consumption, including cooking. The sustainment of nearly 100 JTF members for the seven weeks they spent in Cambodia depended heavily on Canadian Bob's ability to provide support.

### ***Host Nation***

Host nation support in many cases is not dissimilar to coalition or allied support, especially considering that most host nations will either be in the coalition or be an ally. There are subtle differences, however, and the case of ENCAP 96 can again be used as an example. The US defense attaché assigned to the US embassy in Cambodia did not authorize the ENCAP JTF to bring weapons in-country. In a nation at civil war, the JTF commander and Special Operations Command-Pacific did not feel comfortable sending unarmed forces and thus requested host nation security forces at both the base camp and all

work sites. The host nation agreed and additionally supplied thirty engineer troops to assist with the construction efforts of the JTF. Host nations, despite under-developed infrastructures and militaries, may still have the resources to assist US military operations.

These brief discussions of some of the alternative methods of accomplishing BOS and/or AOS are not complete, but are offered as a way of opening the discussion as to their potential. Organic forces cannot always meet the requirements of the support mission despite their organization, training, and equipment. Augmentation forces may be employed to accomplish the entire support role, or they may only tackle a single support task. These forces are available, and in many cases waiting to be asked to assist.

This chapter used the organizational structures discussed in Chapter III and broke them down to representative activities using the definitions found in supporting doctrine, instructions, and other documents. These models were then combined to form a single model that contained all the activities involved in base and airfield operating support. Table 5, Base and Airfield Operating Support, combined with the preceding understanding of organizational structures, tasks, performance standards, and definitions is the definition of both BOS and AOS. Understanding this definition is predicated on an understanding of the associated tasks and activities that are represented. It is an understatement to say BOS and AOS are complicated. A one line or one paragraph definition will not suffice without a previously gained thorough understanding of the underlying principles.

## **V. Conclusions and Recommendations**

### **Conclusions**

The relational model of BOS and AOS, Table 5, demonstrates these tasks are separate, but have overlapping areas of responsibility. The character of flight operations makes them distinct from ground operations and as such, I believe the two tasks to be separable. By separable I mean the tasks listed in Table 5 can be performed by different agencies; whether this is two services, a military service and a number of contractors, or some other combination, is not important. What is important is that the support providers and the support receivers: 1) have mutual understandings of the activities that will be provided; and 2) have mutual understandings of the standard of performance for each activity. Without these basic understandings, the disconnects that plagued the Afghani war will continue, and the soldiers, airmen, marines and seamen in the field will continue to bear the burden of inadequate support.

An article from Air Force Print News, 17 April 2003, titled "Joint Effort Stands Up Iraqi Air Base" may be a signal that at least the Army and Air Force are starting to understand. The opening of Tallil Air Base, Iraq by a joint Army and Air Force is being touted as "one of the finest examples of teamwork seen so far" (Elliot, 2003). What made the operation successful was that each service tackled the areas where they held the expertise. "The division of labor...had the Air Force responsible for bringing the airfield up to operational standards, and the

Army providing security and establishing a logistics center, complete with maintenance and life support systems” (Elliot, 2003).

## **Recommendations**

The first recommendation echoes the sentiment of a joint universal lessons learned input: establish a standard definition for base operating support (BOS). A single definition for BOS allows all services to speak from a common understanding and expectation. Use Table 5 as the foundation of this definition. Each activity is representative of an organizational element in the existing military structure and is supported by existing task requirements. With our military services already training to ensure the capability of providing BOS, providing a clear definition promotes unity of effort through enhanced understanding and a common vocabulary.

The second recommendation then would be to establish a standard definition of airfield operating support (AOS). It is understood that AOS is a separate task from BOS and can be accomplished by a separate force, which makes it deserving of its own definition. As with BOS, Table 5 should be the foundation of the AOS definition.

The third recommendation is necessitated by the first two: codify the definitions for BOS and AOS in doctrine. If service doctrine drives joint doctrine, then the Air Force should strive to place definitions of both BOS and AOS in Air Force doctrine at the soonest possible opportunity. During subsequent revisions

of joint doctrine, especially JP 1-02 (2003), those definitions can be inserted into joint doctrine.

The fourth recommendation is to include a task with performance standards in the Universal Joint Task List for both base and airfield operating support. With a specific task for base and airfield operating support that includes standards of performance, the services will have a better goal toward which to organize, train, and equip. The following tasks and associated performance standards are provided based on the preceding research and tailored to the expeditionary environment:

**Task: Provide Base Operating Support (BOS).**

To provide the personnel, equipment, services, activities and resources required to indefinitely sustain operations at an installation.

The provision of BOS will include at a minimum: a command and control element and structure; a planning element; training and compliance assessment activities; public or civil affairs; legal counsel; a finance and budgeting activity; a contracting capability; spiritual counsel and services; communications including information management activities; field services; personnel services; security services; supply services; transportation services; maintenance services; petroleum, oils and lubricants management and distribution; health services including general medicine, public health, immunizations, and mental health; intelligence services supporting force protection and ground operational support; engineering services including general construction, repair and maintenance activities, and environmental activities; emergency services such as disaster preparedness, explosive ordinance disposal, and structural fire response; ground and weapons safety; and weather forecasting, reporting, and information services.

**Measures and Criteria (Performance Standards):**

1. Number of days from receipt of tasking for designated commander to develop and establish an internal command structure/organization
2. Number of days from receipt of tasking for designated commander to establish command relationships
3. Number of hours from arrival at installation to establish a command post including communications with higher echelon headquarters

4. Number of hours from arrival at installation to send arrival situation report to higher echelon headquarters
5. Number of hours/days from arrival to initiate/establish sustainment and retrograde/evacuation/redeployment plans
6. Number of days from arrival to establish installation training program (e.g., survive and operate, interoperability, mass casualty, host nation interaction, riot control, and security/force protection exercises)
7. Number of hours from arrival to establish non-retribution access for personal or materiel complaints (an inspector general "hotline")
8. Number of days from arrival to establish compliance criteria for training exercises
9. Number of hours from arrival until local interpreters are located, interviewed/screened, and hired to augment military interpreters
10. Number of hours from arrival to schedule first press conference with local media (as applicable)
11. Number of hours from arrival to arrange meeting between US military and local civic leaders
12. Number of days from arrival to coordinate local procedures for jurisdictional transfer in nations without a status of forces agreement with the US
13. Number of days from arrival to review and confirm procedures for local jurisdictional transfer in nations with a status of forces agreement with the US
14. Number of hours from arrival to establish financial disbursement procedures
15. Number of hours from arrival to establish positive control and security procedures for currency
16. Number of days from arrival until initial operational capability to disburse currency
17. Number of hours from arrival to establish procedures for interaction with and support to contracting
18. Number of hours from arrival until initial disbursement in support of contracting element
19. Number of hours from arrival until contracting priorities are coordinated
20. Number of hours from arrival until execution of first support contract with local vendor
21. Number of days from arrival until facility is dedicated for chapel use
22. Number of hours from arrival until first chapel service is performed
23. Percent of assigned personnel on day of first chapel service(s) whose specific religious faith(s) were supported/addressed
24. Number of days to establish religious interaction with local religious leaders
25. Number of hours from arrival to establish confidential counseling services

26. Number of hours from arrival to establish routine secure voice communication links with higher echelon headquarters
27. Number of hours from arrival to establish routine secure data communication links with higher echelon headquarters
28. Number of days from arrival to coordinate frequency use agreements with host nation for handheld and other radio systems
29. Number of days from arrival to establish sustainable local area network
30. Number of days from arrival to establish routine morale call system and access
31. Number of days from arrival to establish routine morale e-mail system and access
32. Number of days from arrival to establish official and personal mail distribution to/from installation, as well as on-base
33. Number of hours from arrival to establish centralized individual and unit supply issue/distribution procedures
34. Number of days from arrival to establish secure storage
35. Number of days from arrival to establish replenishment/sustainment plan for consumables
36. Number of days of supply consumables available on arrival day; day 5; day 10; day 15; day 20; day 25; day 30
37. Number of days from arrival to establish inventory control and reorder levels and procedures
38. Number of days from arrival to establish equipment accounts
39. Number requisitions over one week old
40. Number of hours from arrival to establish a motor pool and vehicle dispatch and control procedures
41. Number of days from arrival to establish vehicle maintenance operations to include applicable environmental protection (e.g., oil/water separator or containment of petroleum, oil, and lubricant products)
42. Number of vehicles/equipment down for parts
43. Number of vehicles/equipment down for maintenance
44. Number of days from arrival to establish secure ground lines of communication for surface movement of supplies
45. Number of days from arrival to establish equipment maintenance operations to include applicable environmental protection
46. Number of days from arrival to secure munitions storage capability to include permits, waivers, and safety features
47. Number of hours from arrival to establish ground fuels management and distribution procedures
48. Number of days from arrival to establish secure resupply of ground fuels to meet consumption/mission requirements via truck, rail, pipeline, ship, and/or air delivery
49. Number of hours from arrival until first hot meal is served

50. Percentage of personnel receiving at least two hot meals per day on day 1; day 2; day 3; day 4; day 5; day 10; day 15; day 30
51. Number of days from arrival to establish refrigerated and frozen food capability
52. Number of days from arrival until first hot shower is provided
53. Percentage of personnel able to receive hot showers each day on day 1; day 3; day 5; day 7; day 10; day 15; day 30
54. Number of days from arrival to establish laundry capability
55. Number of hours from arrival to establish morgue procedures
56. Number of days from arrival to establish morgue
57. Number of hours from arrival to establish billeting plan as coordinated with the engineers
58. Number of days from arrival to establish an initial fitness and recreation plan
59. Number of days from arrival to establish a recreation facility
60. Number of days from arrival to establish a field exchange for personal consumables
61. Number of hours from arrival to establish expeditionary emergency medical procedures and facilities
62. Number of days to assess host nation emergency medical capabilities
63. Number of days to establish sustainable emergency medical facilities
64. Number of hours from arrival to establish patient evacuation procedures
65. Number of hours from arrival to establish blood stock procedures
66. Number of days from arrival to establish a sustainable blood stock storage facility
67. Number of days to initiate water and food testing procedures
68. Number of days to establish sick-call operations
69. Number of days after arrival to establish pharmacy operations
70. Number of hours after receipt of tasking to brief commander on local threats to installation
71. Number of hours after arrival at installation to establish secure lines of communication to higher echelon headquarters and home station for intelligence updates
72. Number of hours after arrival at installation to obtain current satellite imagery of local area and/or enemy troop emplacements, movements, and/or concentrations
73. Number of hours after arrival to establish a spot inspection program for ground/weapons safety
74. Number of hours from identification of safety hazard until appropriate owning agency (i.e., engineers, communications, munitions maintenance) is notified
75. Number of days/hours from arrival to coordinate explosive sightings



76. Number of days/hours from arrival to coordinate explosive transportation routes
77. Number of days from arrival to test and document lighting protection systems at all explosive handling sites
78. Number of hours after arrival to establish work order priority system
79. Number of hours after arrival to complete facility assessments and unit assignments
80. Number of days after arrival to establish service contracts (e.g., refuse collection and removal; commercial power, water, sewer; fuels)
81. Number of days after arrival to establish facility leases to meet space requirements
82. Number of hours after arrival until first tent/hard billet is available for assignment or occupation
83. Percentage of personnel billeted in tents/hard billets at end of day 1; day 2; day 3; day 4; day 5; day 10; day 20; day 30
84. Number of days after establishment of installation until all personnel are billeted in tents/hard billets
85. Number of days after arrival until first contract executed for Class IV materiel
86. Number of hours from identification to completion of emergency work orders (average)
87. Number of days from identification to completion of routine work orders (average)
88. Number of hours after arrival to establish personnel accountability procedures
89. Number of hours after arrival to establish personnel records keeping system and procedures
90. Number of hours after arrival to establish a fire protection plan/program
91. Number of days after arrival to establish a sustainable fire alarm control center
92. Number of hours after arrival to establish an installation warning system including alarm signals, flags, loud speaker systems
93. Number of hours after arrival to establish and disseminate guidance on passive defense activities (e.g., dispersal; camouflage, concealment and deception; blackout procedures; mission oriented protective procedures (MOPP); contamination avoidance; explosive ordnance reconnaissance)
94. Number of days to establish a revetted and/or bermed explosive ordnance disposal/containment site
95. Number of hours after arrival to establish explosive ordnance disposal response plans and procedures
96. Number of days after arrival to establish a line of communication to supporting Air Force weather center(s)
97. Number of hours after arrival to initiate local area weather forecasting

98. Number of hours after arrival to complete perimeter security assessment
99. Number of hours after arrival to establish perimeter security
100. Number of hours after arrival to designate, establish, and man entry control points
101. Number of hours after arrival to develop rapid reaction plan
102. Number of days after arrival to coordinate rapid reaction plan with host nation security forces (if applicable)

**Task: Provide Airfield Operating Support (AOS).**

To provide the personnel, equipment, services, activities and resources required to indefinitely sustain aircraft operations at an installation.

The provision of AOS will include at a minimum: aircraft maintenance and refueling activities; life support activities for both aircraft systems and crew-issued/-carried equipment; airport/airfield management activities; air traffic control, navigation aids, and approach control; aircraft marshalling and command and control; cargo handling to include aircraft unloading and loading, documentation, pallet build-up and break-down, custody transfer and accountability; passenger handling to include screening, manifesting, and enplaning and deplaning.

AOS will also include the provision of activities that supplement BOS activities to support air operations. In general, they will include activities such as: air munitions maintenance; aerospace ground and materiel handling equipment maintenance; aviation fuels management and distribution; an aeromedical evacuation activity; flight medicine; air intelligence support for targeting, tactics, and aerial power projection; engineering capabilities that include airfield lighting, aircraft barrier installation and maintenance, rapid runway repair, and airfield sweeping; a crash/rescue response activity; flight and air weapons safety expertise; and global and upper atmosphere weather forecasting.

**Measures and Criteria (Performance Standards):**

1. Number of hours after arrival to establish aircraft refueling procedures
2. Number of hours after arrival to conduct aircraft refueling capabilities assessment
3. Number of hours after arrival to commence aircraft refueling
4. Number of aircraft delays caused by fuel maximum on ground (MOG)
5. Number of hours after arrival to establish aircraft maintenance priorities, procedures, and policies
6. Number of days after arrival to establish backshops
7. Number of days after arrival to establish liquid oxygen capability
8. Number of days after arrival to establish sustainable life support activity
9. Number of aircraft delays caused by maintenance
10. Number of hours after notification to designate airfield manager

11. Number of hours after arrival to complete multidiscipline airfield survey
12. Number of hours after arrival to designate and establish base operations—central command and control of the airfield
13. Number of hours after arrival to assume air traffic control responsibility
14. Number of hours/days after arrival to install, test, and operationalize approach controls and navigation aids for airfield
15. Number of aircraft missions diverted because of issues with navigation aids/approach control
16. Number of hours after arrival to establish and publish taxi instructions, marshaling procedures, and other facets of the control of aircraft on the ground
17. Number of hours after arrival to establish communications capability with arriving/departing aircraft and assume duties for command and control in the local area
18. Number of hours after arrival to establish flight line driving qualifications, procedures, and requirements
19. Number of hours after arrival to establish materiel handling equipment management procedures
20. Number of hours after arrival to establish cargo handling procedures
21. Number of hours after arrival to establish cargo marshaling yard
22. Number of hours after arrival to initiate coordination with supply and using agencies concerning cargo pick-up and delivery
23. Number of hours after arrival to establish passenger handling procedures
24. Percent of passenger manifests coordinated with personnel accountability activity
25. Number of aircraft missions delayed because of working MOG
26. Number of aircraft missions missed because of munitions issues
27. Number of aircraft delays caused by cargo or passenger issues
28. Number of aerospace ground and materiel handling equipment down for parts and/or down for maintenance
29. Number of hours after arrival to establish aviation fuel handling and distribution
30. Number of days of aviation fuel available based on aircraft
31. Number of hours after arrival to establish aeromedical evacuation plan and procedures
32. Number of days to establish installation flight medicine
33. Number of hours to establish secure intelligence communications to assist in targeting and tactics for air targets
34. Number of hours after arrival to establish flight safety office with standards and procedures
35. Number of hours after arrival to install aircraft barriers
36. Number of hours after arrival to assess condition of airfield lighting
37. Number of hours after arrival to install expedient airfield lighting system

- 38. Number of days after commencement of aircraft operations until airfield sweepers arrive on station
- 39. Number of aircraft damaged by foreign objects
- 40. Number of hours after arrival to establish crash/rescue response activities
- 41. Number of hours after arrival to initiate global weather forecasting

The complexity of providing base and/or airfield operating support is apparent in these two tasks. With a primary focus on initial beddown, I was able to generate a substantial number of performance standards from across the spectrum of activities encompassed by BOS and AOS. The scope of developing a comprehensive list of performance standards that all the services could agree upon is a daunting task, but should be a goal to alleviate much of the confusion and frustration with differing levels of support found in the field.

## **Limitations**

As mentioned in the preface, this research effort was undertaken by an Air Force officer. Many of the issues, terms, and research documents concerned the Army and its organization and structure. My understanding of the Army was limited by my experience as supplemented only through the reading of numerous field manuals, joint publications, and various doctrine documents. I attempted to provide as thorough an analysis as I could given this limitation. Any misrepresentation of the Army was not intentional. Along that vein, I sought the counsel of several Army officers at various levels and from different organizations and backgrounds for comment on the accuracy of information about the Army.

The scope of this project did not dawn on me until I was well into it. The issue of base operating support is complex. It is greatly compounded when you consider if and how one might separate it from airfield operating support. I originally wanted to evaluate each service's ability to perform the mission of BOS and AOS against a common set of criteria that I intended to develop. I found just defining BOS and AOS to be a daunting enough task. This paper represents my best effort in the allotted time, but it is just a beginning.

### **Areas for Further Study**

This report focused on the capabilities and organization of the Air Force and Army. As discussed in the previous chapter, there are alternative methods of accomplishing all or portions of the base and airfield operating support missions. Areas for further study should include the Navy and Marine Corps. Although they appear to be tied closely to the littoral areas, they may have unseen capabilities that allow them to accomplish major portions of BOS and AOS. A research effort in this area may lay the foundation for doctrinal change in relation to Naval and Marine force employment.

A second area for further research would be an examination of the contract capabilities of the three service contracts, LOGCAP, AFCAP, and CONCAP. Research analysis of these contracts might include how best to use these contracts to provide BOS and/or AOS. Other research topics might be to analyze

how well the military works with the contractors or how well different contractors work together.

A third area for further research, and the one of most interest to this author, is a study of the proposed NATO CALCE. Currently, transportation and logistics support of a NATO country's forces are national responsibilities. The CALCE will break this paradigm by forming a multinational force to provide support to all nations operating in a specific mission. The goal is to reduce the deployment footprint and increase effectiveness by capitalizing on the expertise of member nations by assigning them roles at which they are most proficient. (Thomson, 2002)

## **Glossary – Abbreviations and Acronyms**

A/DACG	Arrival/departure airfield control group
AEF	Air Expeditionary Force (Air Force)
AEW	Air expeditionary wing
AFDD	Air Force doctrine document
AFCAP	Air Force Contract Augmentation Program
AFI	Air Force instruction
AFT	Air Force task
AFTL	Air Force Task List
AMC	Air Mobility Command
AMS	Air mobility squadron
AO	Area of operations
AOS	Airfield operating support
APOD	Aerial port of debarkation
APOE	Aerial port of embarkation
ART	Army task
ASETf	Air and space expeditionary task force (Air Force)
ASG	Area support group (Army)
AUTL	Army Universal Task List
BOS	Base operating support
BSB	Base support battalion
C2	Command and control
CALCE	Combined airlift control element (NATO, RFAS)
CALL	Center for Army Lessons Learned
CFLCC	Combined force land component commander; coalition forces land component commander
CJCS	Chairman of the Joint Chiefs of Staff
Class I	Supply: Subsistence
Class II	Supply: Clothing, individual equipment, tools, administrative
Class III	Supply: Petroleum, oils, lubricants
Class IV	Supply: Construction materials
Class V	Supply: Ammunition
Class VI	Supply: Personal demand items
Class VII	Supply: Major end items, i.e., racks, pylons, tracked vehicles
Class VIII	Supply: Medical materials
Class IX	Supply: Repair parts
Class X	Supply: Material for nonmilitary programs
CONUS	Continental United States
COSCOM	Corps support group (Army)
CS	Combat support
CSS	Combat service support
CUL	Common-user logistics
CZ	Communications zone

DA	Department of the Army
DISCOM	Division Support Command (Army)
DOD	Department of Defense
FM	Field manual
HQ	Headquarters
ITV	In-transit visibility
JCS	Joint Chiefs of Staff
JOA	Joint operations area
JP	Joint publication
JTF	Joint task force
JULLS	Joint Lessons Learned System
LOC(s)	Line(s) of communication
LOGCAP	Logistics Civil Augmentation Program (Army)
LZ	Landing zone
MACOM	Major command (Army)
MAGTF	Marine Air Ground Task Force
MET	Mission essential task
METL	Mission essential task list
MHE	Materiel handling equipment
MI	Military intelligence
MOG	Maximum on ground
MP	Military police
NAF	Numbered air force
NATO	North Atlantic Treaty Organization
NTA	Naval force tactical task
NGO	Nongovernmental organization
NLL	Navy Lessons Learned
OCONUS	Outside the continental United States
OEF	OPERATION Enduring Freedom
OP	Operational task, associated with mission essential tasks
PAD	Program action directive
POD	Port of debarkation
RDD	Required delivery date
RED HORSE	Rapid engineers deployable heavy operations repair squadron, engineers
RFAS	Reaction Force Air Staff (NATO)
RRR	Rapid runway repair
SOFA	Status of forces agreement
TA	Tactical Task, associated with Mission Essential Tasks
TALCE	Tanker Airlift Control Element (Air Force)
TFEL	Task Force Enduring Look (Air Force)
UJTL	Universal Joint Task List
UNTL	Universal Naval Task List, comprises Navy, US Marine Corps and US Coast Guard tasks
USG	United States Government



## Bibliography

- Air Force Doctrine Center (AFDC). Air Force Task List (AFTL). AFDD 1-1. Maxwell AFB: AFDC, 12 August 1998.
- . Organization and Employment of Aerospace Power. AFDD 2. Maxwell AFB: AFDC, 17 February 2000.
- Center for Army Lessons Learned (CALL). Initial Impressions Report: ARCENT Combined Arms Assessment Team, Operation ENDURING FREEDOM (For Official Use Only). Fort Leavenworth, Kansas: U.S. Army Training and Doctrine Command (TRADOC), September 2002.
- Department of the Air Force. Air Force Organization. AFI 38-101. Washington: Headquarters Air Force (HQ AF), 1 July 1998.
- . Headquarters United States Air Force Program Action Directive: Implementation of the Chief of Staff of the Air Force Direction to Establish a New Combat Wing Organization Structure. PAD 02-05. Washington: HQ AF, 20 June 2002.
- Department of the Army (DA). Area Support Group. FM 54-40. Washington: HQ DA, 3 October 1995.
- . Army Air Traffic Services Contingency and Combat Zone Operations. FM 1-120. Washington: HQ DA, 22 May 1995.
- . Army Operational Support. FM 100-16. Washington: HQ DA, 31 May 1995.
- . Combat Service Support. FM 100-10. Washington: HQ DA, 3 October 1995.
- . Corps Support Command. FM 63-3. Washington: HQ DA, 30 September 1993.
- . Division Support Command: Armored, Infantry, and Mechanized Infantry Divisions. FM 63-2. Washington: HQ DA, 20 May 1991.
- . Installation Management. FM 100-22. Washington: HQ DA, 11 October 1994.
- Darling, Douglas, DA Civilian, US Army Combined Arms Center. E-mail correspondence. 2 January 2003.

Department of the Navy. Organization of Marine Corps Forces. MCRP 5-12D. Washington: Headquarters United States Marine Corps, 13 October 1998.

----- Universal Naval Task List. (UNTL) OPNAVINST 3500.38A/USCG COMDTINST M3500.1A. Washington: Navy Warfare Development Command. 3 October 2002.

Elliot, Scott, Master Sergeant, public affairs craftsman, Air Force Print News columnist. "Joint Effort Stands Up Iraqi Air Base," Air Force Print News, 17 April 2003. <http://www.af.mil/news/Apr2003/4170365print.shtml>

Fox, Dean L, Brigadier General. The Civil Engineer, Headquarters Air Mobility Command. E-mail correspondence to Acting AMC/CV. 18 March 2002.

----- E-mail correspondence to General John Handy, USCINCTRANS. 3 May 2002.

Higdon, Anthony, Major, Expeditionary Engineering Branch, Installations and Logistics Directorate, HQ USAF. E-mail correspondence. 28 October 2002.

Joint Chiefs of Staff (JCS). Department of Defense Dictionary of Military and Associated Terms. Joint Publication (JP) 1-02. Washington: Government Printing Office (GPO), 12 April 2001; As Amended Through 9 January 2003.

----- Doctrine for Intelligence Support to Joint Operations. JP 2-0. Washington: GPO, 9 March 2000.

----- Doctrine for Logistic Support of Joint Operations. JP 4-0. Washington: GPO, 6 April 2000.

----- Engineer Doctrine for Joint Operations. JP 3-34. Washington: GPO, 5 July 2000.

----- Joint Doctrine and Joint Tactics, Techniques, and Procedures for Air Mobility Operations. JP 3-17. Washington: GPO, 14 August 2002.

----- Joint Doctrine Encyclopedia (JDE). Washington: GPO, 16 July 1997.

----- Joint Doctrine for Civil Engineering Support. JP 4-04. Washington: GPO, 27 September 2001.

----- Joint Force Capabilities. JP 3-33. Washington: GPO, 13 October 1999.

----- Joint Tactics, Techniques, and Procedures for Common-User Logistics During Joint Operations. JP 4-07. Washington: GPO, 11 June 2001.

-----. Joint Tactics, Techniques, and Procedures for Joint Logistics Over-the-Shore (JLOTS). JP 4-01.6. Washington: GPO, 12 November 1998.

-----. Joint Tactics, Techniques, and Procedures for Transportation Terminal Operations. JP 4-01.5. Washington: GPO, 9 April 2002.

-----. Joint Warfare of the Armed Forces of the United States. JP 1. Washington: GPO, 14 November 2000.

-----. Universal Joint Task List, Version 4.2. CJCSM 3500.04C. Washington: GPO, 1 July 2002.

Joint Uniform Lessons Learned System (JULLS). Multiple inputs, multiple sources maintained in on-line secure database accessed through United States Central Command website. Inputs, sources referenced by JULLS number. <http://recluse.centcom.smil/jullssearch/>. Dates vary with input.

Navy Lessons Learned (NLL). Multiple inputs, multiple sources maintained in on-line secure database accessed through Navy Warfare Doctrine Center website. Inputs, sources referenced by NLL number. <http://www.nwdc.navy.smil.mil/nlls/>. Dates vary with input.

Robison, Dwayne M. Executive Officer, Directorate of Civil Engineering, Headquarters Air Mobility Command. Telephone conversation. November 2002.

TASK FORCE Enduring Look (TFEL). (U) Interim Report 2: The Air And Space Operations Over Afghanistan: 7 October 2001 – 14 January 2002 (Secret//NOFORN). Secure web publication for Air Force Major Command coordination. <http://www.tf-el.af.pentagon.smil.mil/>. 20 December 2002.

-----. (U) Quick Look Report #2, Combat Support and Expeditionary Basing (Secret). Secure web publication. <http://www.tf-el.af.pentagon.smil.mil/>. March 2002.

-----. "Terms of Reference: Task Force Enduring Look (AF/CVX)." Washington: HQ AF, 13 May 2002.

Thomson, Andy, Wing Commander, Royal Air Force. "RFAS Mobility: Airlift, Movements, and Transportation." Briefing to Advanced Study of Air Mobility Students. North Atlantic Treaty Organization Combined Air Operations Center 2, Kalkar, Germany. 6 May 2003.

United States Army Combined Arms Center. The Army Universal Task List (AUTL). FM 7-15, Post-DRAFT (Draft). Unpublished. Staffing Status Current as of 17 December 2002.

## **Vita**

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